MAY 25, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

TOOL AND DIE SHOPS SUFFER

Diemakers have not pulled out of the recession as expected. They're also hampered by vicious price cutting. But all is not bleak. Specialized shops are faring well; '61 cars raise hopes—see Page 92.

Page 89 . . .

In General Steel Strike, 12% Of Capacity Would Still Operate

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U. S. Tool Capacity Goes Abroad

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Lubricant Cuts Stamping Costs

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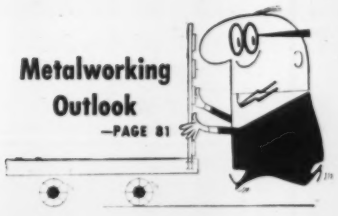
Slag Washing Upgrades Stainless

Page 152 . . .

Electromagnetic Fixtures Reduce Wasted Motion in Loading Parts

Page 173 . . .

Granite City Steel Shapes Future



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How B&W JOB-MATCHED TUBING reduces fabrication costs in pressure tube applications

. . . Uniform mechanical properties—provide ease of fabrication . . . reduces fabrication costs.

. . . Close tolerances—provide ease of threading through tube sheets, baffles and headers . . . reduces fabrication costs.

. . . Desired lengths—long or short, eliminates field welding or cutting . . . reduces fabrication costs.

These are just a few of the reasons why it pays to specify B&W Job-Matched Pressure Tubing. And it is available in a complete range of sizes and in a full range of carbon, alloy and stainless steels. Call the tubing specialist at your local B&W District Sales Office, or write for Bulletin TB-417 for full information. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pennsylvania.

B&W

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TUBULAR PRODUCTS DIVISION

TA-9028-G4

Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals

STEEL USERS WITH QUESTIONS

ABOUT THE SELECTION AND FABRICATION OF STEEL

CAN GET ANSWERS FAST WHEN

THEY CALL THEIR LOCAL STEEL SERVICE CENTER.

HELP ON STEEL PROBLEMS --

BASED ON EXPERIENCE GAINED IN WORKING WITH

HUNDREDS OF STEEL USERS -- IS JUST ONE OF

MANY SERVICES OF YOUR LOCAL STEEL SERVICE CENTER.

WHETHER YOU NEED STEEL -- OR ANSWERS --

YOUR STEEL SERVICE CENTER CAN DELIVER!

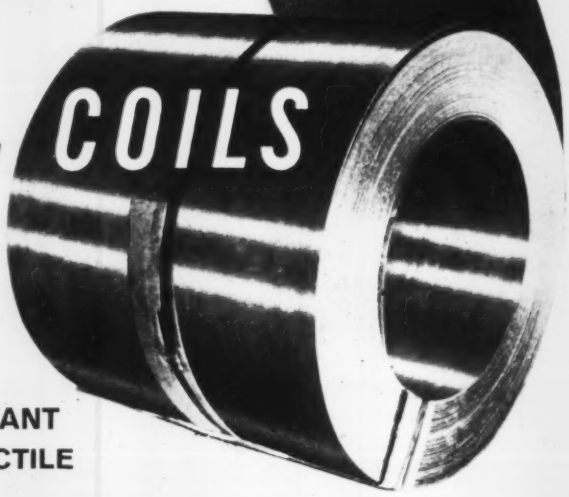
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Bethlehem Pacific Coast Steel Corporation,
San Francisco

BETHLEHEM STEEL

CONTINUOUS-LINE GALVANIZING

Gives You Even More In COILS



Yes, you get the basic advantages of continuous-line galvanized sheet metal:

A CORROSION-RESISTANT ZINC COATING AS DUCTILE AS THE STEEL BASE

You can

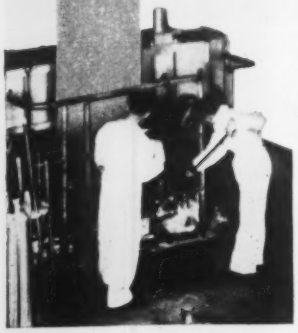
STAMP IT **SPIN IT** **CRIMP IT** **DEEP-DRAW IT** **LOCK-FORM IT**

But you can't **FLAKE IT** **CHIP IT** **PEEL IT** **CRACK IT**

AND THE DIVIDEND

In Coil Form, you

- **SAVE STORAGE SPACE**
- **SLASH HANDLING COSTS**
- **REDUCE SCRAP LOSSES**
- **ELIMINATE SHEET END TRIMMING**
- **CUT ODD SHEET INVENTORIES**



Exit end of continuous galvanizing line

The St. Joseph Lead Company is in the unique position of being able to supply zinc to virtually any specification which operators of continuous galvanizing lines consider most desirable for their individual requirements.

ST. JOSEPH LEAD COMPANY

ST. JOE

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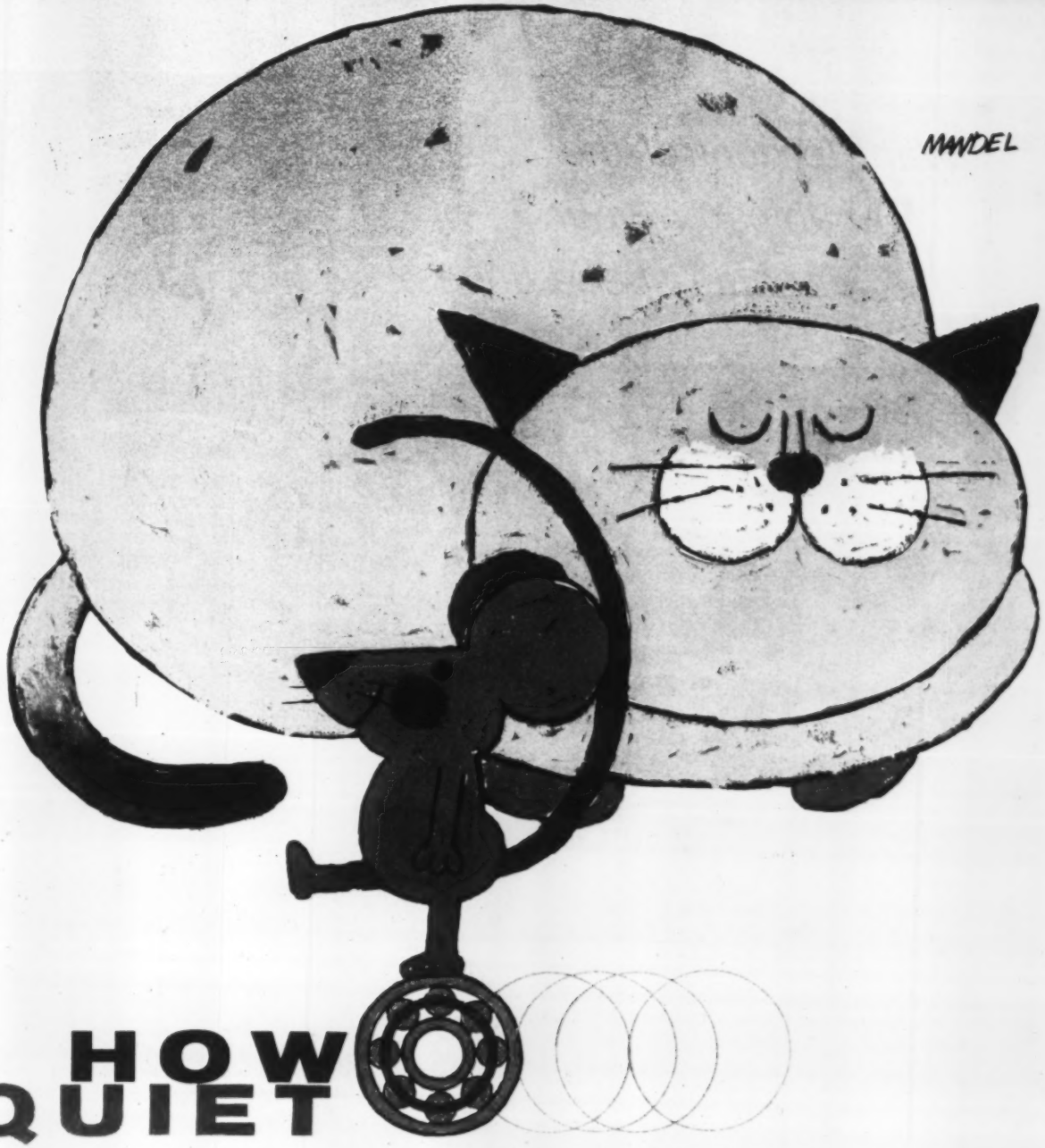
ZN-127.



HOW QUIET can a ball bearing be?

Federal Ball Bearings are to be seen, but not heard! Elusive noises are intercepted by inspection engineers at "quiet control" points all along our production line. They want to hear the soft, sweet purr that signifies a perfect bearing, because that's the only kind we'll tolerate. That's why every bearing goes through scores of quality control tests before we send it out. Customers who get these perfect bearings number among the most respected names in American industry. We'd like to include you. Start with our catalog—over 12,000 ball bearing sizes, hundreds of types. Send for it today.

THE FEDERAL BEARINGS CO., INC., Poughkeepsie, N. Y.

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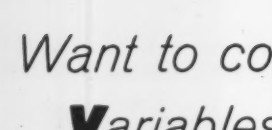
BALL BEARINGS

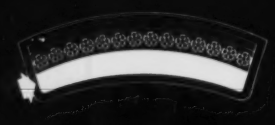
One of America's largest ball bearing manufacturers

FEDERAL ON FILM—A 16 mm. color sound film takes you through our 400,000 sq. ft. plant. Loaned free. Just ask for it.

Want to control the Variables on your Variable-speed drives?

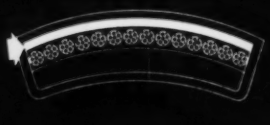


Control Slippage with Goodyear Variable-Speed Belts that have a specially compounded, abrasion-resistant cover to take a strong, uniform grip on both sides of the sheave.

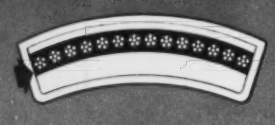


Control "Dishing" with Goodyear Variable-Speed Belts that incorporate a special, fiber-reinforced, synthetic-rubber compression section to resist side pressures – protect from fatigue.

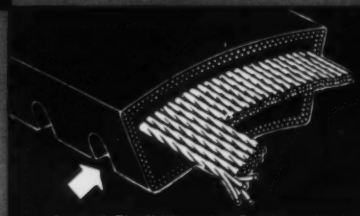
Control Shrinkage-Stretching with Goodyear Variable-Speed Belts that are sinewed by exclusive Triple-Tempered (3-T) Cord for true dimensional stability in storage and in use.



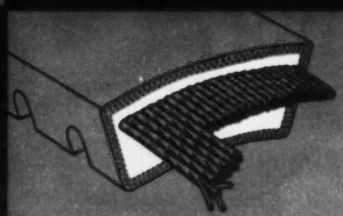
Control Uneven Pull with Goodyear Variable-Speed Belts that feature a special, "cool-running" tension section to assure balance of yield – equalizing pull on either side of the belt.



Control Chafing Action with Goodyear Variable-Speed Belts that have a special "floating gum" insulating section to transfer all the load to the load-carrying cords.



Control Flexibility with Goodyear Variable-Speed Belts that are notched with absolute uniformity to bend easily over small pulleys without sacrifice of rigidity or strength.



Control Uniformity of Cross Section with Goodyear Variable-Speed Belts that are precision-molded for uniformity throughout their full length.

Variable-speed drives are tough enough—without having to contend with variations in the performance of the belts you use.

That's why so many design men insist on the *controlled* quality construction of Variable-Speed Belts by Goodyear. They know these belts are an invariable cure for the headaches so common to variable-speed-drive users.

For the belts that assure you maximum, trouble-free horsepower hours at minimum cost – in a complete range of 371 sizes to meet every need—check with the G.T.M.—Goodyear Technical Man—through your Goodyear Distributor. Or write Goodyear, Industrial Products Division, Lincoln 2, Nebraska, or Akron 16, Ohio.

IT'S SMART TO DO BUSINESS with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."

VARIABLE-SPEED BELTS BY

GOODYEAR

THE GREATEST NAME IN RUBBER

This Week in STEEL

The Metalworking Weekly

May 25, 1959
Vol. 144 No. 21

EDITORIAL 87

The problem of our vanishing markets as the result of foreign competition must be attacked at its roots.

SPECIAL FEATURE 92

Diemakers Suffer; '61 Cars May Help

Diemakers' shipments fell from $1.3 billion in 1957 to $925 million last year. Hope for a speedy recovery is dim as the industry's '59 pace lags.

WINDOWS OF WASHINGTON 98

Maneuvering for a tax cut has begun. Don't get too excited. Any reforms will be relatively minor.

MIRRORS OF MOTORDOM 107

By 1964, Du Pont hopes to double use of plastics in cars, competing with zinc, stainless, aluminum.

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Capital goods, a late starter, gets into recovery sweepstakes with autos, construction, steel, appliances.

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STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

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behind the scenes

Some Background Stuff

Our natural modesty prevents us from openly claiming kinship with wisdom teeth and vermiform appendices, but this commendable reluctance doesn't alter the relationship: We're all three vestigial remnants of early developments that have sidetracked themselves in a modern world.

In September, 1937, the editors of STEEL instituted a department which they called "Behind the Scenes." They planned to use the space to gossip about editorial personnel, comment on coming attractions, reveal stories behind stories, and generally get cozy with the reader. The page was to be an informal meeting ground, and it made its first appearance in the Sept. 20 STEEL, on Page 176, back in the market section. It didn't make the contents page, possibly because editorial management feared to give it an air of permanency.

The name Shrdlu was selected as a byline because this grouping of letters is synonymous with editorial anonymity. The letters are formed when a Linotype operator sweeps his hand across a row of keys on his machine. If you were to make a glissando across the bottom row of keys on your typewriter, for example, you would create the word zxcvbnm. In passing, it might be noted for the record that this word has met with little favor, either because of our stuffy attitude toward exotic cacophony, or our inability to pronounce it, or both.

The Reader Is Served

Over the years, half a dozen men took their turn as Shrdlu, and successively raised the quality of the page until the current Shrdlu took over five years ago. He was instructed to hold the page until the editors worked out a new and improved formula for reader service. Indeed, concern for the reader guides all STEEL editorial and advertising activity. Readers of business publications look for information and ideas; it is the prime responsibility of business magazine publishers to supply them. Progressive business publications constantly adjust themselves to modern times; if they don't, they stand an excellent chance of being referred to as former business publications.

Readers of the world's foremost metalworking weekly will be happy to learn that the new formula mentioned above has been formulated: Beginning next week, an alert, helpful character named Ed Service will take over this page; he will serve as guide, conductor, expediter, and general liaison editor. A new look in reader service, the feature will make its bow on Page 5 of the June 1 STEEL. The old look, in the form of Shrdlu's "Behind the Scenes," ends right on this page.

Winding up the affairs of ourselves and our predecessors involved an extended amount of research in old bound volumes because nobody could remember for sure when the feature started, or how it began. The main trouble with research is the researcher's straying interest: He is inclined to follow every intriguing trail that presents itself, and he gets nowhere in a hurry, like a coon dog turned loose in a game preserve. The Sept. 20, 1937, issue of STEEL was loaded with fascinating crosstrails.

Looking Backward

News from Detroit hinted that Cadillac, spurred by Cord's success, was about to spring a completely different model for 1938. It was rumored that the new model would have no running boards. If we can permit ourselves a comment, in the light of events that came long after, it seems that the running boards dried up and blossomed years later as fins.

Our Washington editor solemnly reported that structural activity in 1937 would be moderately above that of 1936, and nobody could have made a more cautious report than that, particularly when it should be remembered that structural activity in 1937 had nowhere to move but up. He mentioned also that Congress was investigating the staggering amount of scrap flowing out of the country. Armament programs in Britain, Japan, and Italy were draining off America's scrap supply—but we got a lot of it back—right square in the teeth.

Exit Shrdlu

Average hourly earnings in 1937 increased from 70.7 cents in June to 71.0 cents in July. Well, maybe them 1937 cats couldn't buy Jaguars with that faded spinach, but they seemed to be doing all right in their Model As.

A feature story described the production of sterling silver flatware, a technical article concerned progress in steelmaking—but what has all this got to do with Shrdlu closing up shop? Ah, that's the trouble with old magazines: You go barking after every item, and forget what you started out to investigate.

Washington, Napoleon, Chief Logan, and Lincoln made some notable farewells, but we can't seem to lift anything appropriate from their remarks. Let us, therefore, thank you for your attention and forbearance; saying which, we bow, back into the curtain, it falls and envelops us—and thus, in character to the end, a muffled "so long, folks!" comes from

Shrdlu

(Metalworking Outlook—Page 81)

For the savings in tool costs made by Hydroforming

Col. Herman E. Lacy calls this his

MILLION DOLLAR AISLE"

Col. H. E. Lacy is owner of Hydroforming Company of America, Inc., Chicago. As one of the nation's leading suppliers of custom Hydroformed parts, he is exceptionally well qualified to talk on tool cost savings. "The unique Hydroform technique," says Col. Lacy, "has saved our customers *millions of dollars of tool costs.* Further, Hydroforming combines extreme precision in deep drawing, with versatility that gives designers unequalled freedom. Better drawn parts, in fewer operations, at lower costs, can be yours by Hydroforming."

The photo above shows five Cincinnati Hydroform® machines in operation at this custom deep drawing shop—an 8", a 12", two 19" and a 23" size machine. The company's capacity for producing larger Hydroformed parts will soon be increased by the addition of a Cincinnati 32" Hydroform.

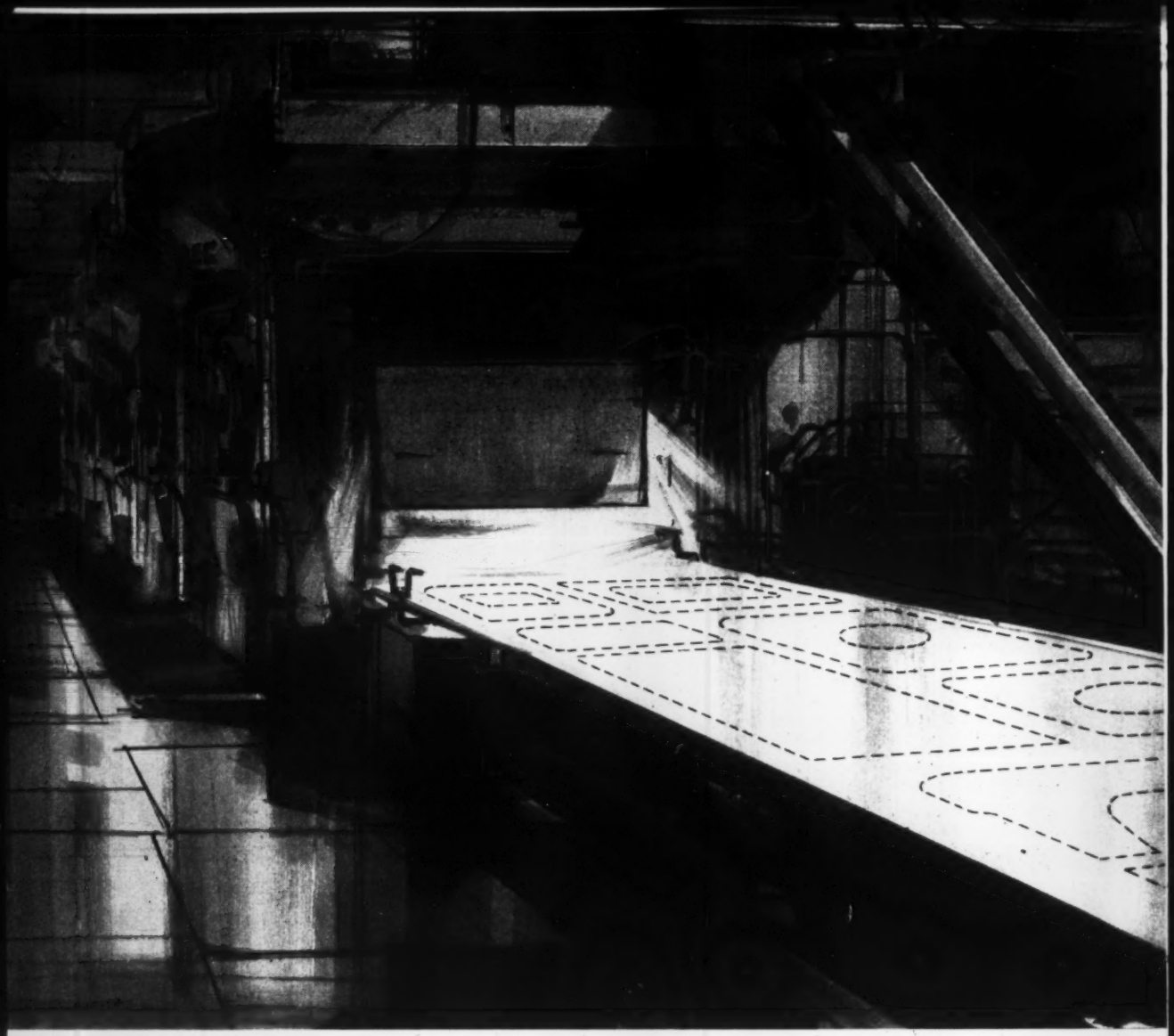
To determine if Cincinnati Hydroform machines can produce savings for your manufacturing program, call in a Meta-Dynamics Division field engineer.

META-DYNAMICS DIVISION
Machines for Metal Forming and Heat Treating

THE CINCINNATI MILLING MACHINE CO.
Cincinnati 9, Ohio, U.S.A.

CINCINNATI

This photo of a display panel at Hydroforming Company of America, Inc., shows the wide range of Hydroformed part size, gage and complexity of shape produced by this firm.



IN PRODUCT AFTER PRODUCT AFTER PRODUCT . . . WEIRTON HOT- AND COLD-ROLLED SHEET

Is your product as complicated as automobile sheet metalwork? Or as tough to form as a portable TV cabinet? Or as dependent on good looks as laundry equipment?

Then Weirton hot- or cold-rolled sheet is for you, too. It brings you the triple advantages of uniform gauge, uniform strength, uniform ductility. It holds up under your toughest fabrication steps, helps you turn out a better product at lower cost. And it'll prove itself in your product, just as it has in thousands of others.

Weirton produces top quality sheets to serve the needs of modern fabrication. For prompt and complete information, just phone or write Weirton Steel Company, Dept. B-4, Weirton, West Virginia.

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NATIONAL STEEL CORPORATION

Man's Eternal Struggle with the Machine

COMPETITIVE PRESSURES AND RISING COSTS DEMAND GREATER PRODUCTION EFFICIENCY THAN EVER BEFORE

How do you know you're making your product right?

Rather curious question, isn't it! But before you laugh it off, take a good look at what's happening on your production line. There's more processes using manufacturers than there are manufacturers using processes.

What you're looking for is efficiency. Lack of it costs money. The kind *you* pay in overhead, competitive advantage, rejects, rework operations, etc.

For example—consider your resistance welding . . .

How many spot welds are you using to assemble the piece parts of your product? . . . as many as will fit in the space? . . . enough to "be sure" it will hold? . . . or as many as *really required!* No matter how you figure it, the first two cost too much money. Because they require either too much equipment or too much time. Usually both!

Many manufacturers use resistance welding for speed. Weld integrity (which, incidentally, does not necessarily penalize speed) is often overlooked. In order to make up for lack of weld quality, more welds are used. But fifty poor welds aren't any better than fifteen poor welds. They just cost more. Particularly when five *welds of suitable quality* will do the job!

Sciaky knows that weld efficiency is a matter of combining quality with speed. That's why Sciaky equipment is precise enough to produce consistently. Once suitable quality is established, you can depend on it throughout the toughest production conditions.

Why take less than the full advantage of consulting with a Sciaky Application Engineer the next time you're considering equipment. No obligation, of course.

The manufacturers of automobile wheels took that advantage. As a result those wheels are now being assembled with eight suitable quality welds instead of twelve rivets. Automatically. Four other operations have even been included. As a result, the wheels are better, and made faster at lower cost.

SCIAKY®

74A

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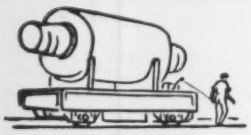
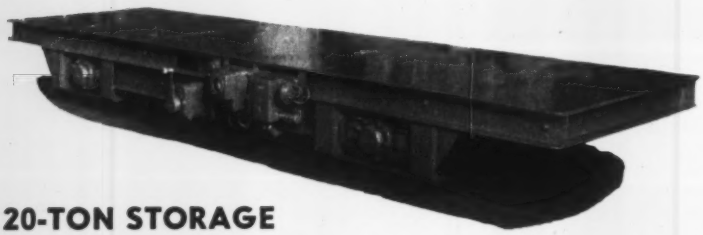
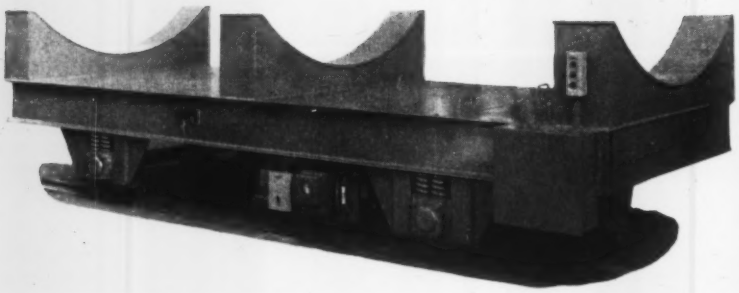
ATLAS SAFETY TYPE "SHORT HAUL" TRANSFERS



Atlas Safety-Type Transfers provide safe, low-cost service. Available with gas or diesel-electric, cable reel, or storage battery power. Atlas Transfers handle any type of load . . . and the heavier the load, the greater the savings.



20-TON STORAGE BATTERY FLAT CAR



20-TON STORAGE BATTERY WITH CRADLE FOR PIPE

Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS TO THE EDITORS

Wanted: Productivity Killers

"How to Combat These Productivity Killers" (May 11, p. 114) was read with much interest. I would like to have 15 copies for distribution to our supervisors.

N. W. Blakely
General Manager
Benwood Works
Wheeling Steel Corp.
Benwood, W. Va.

Requests Reprints for Congress

Will you please send me two reprints of "The Case of the Vanishing Jobs" (Apr. 6, p. 99)?

One is for a senator, and one for a representative.

J. W. O'Brien
Purchasing Agent
Steel City Testing Machines Inc.
Detroit

Refigures Metal Use in Autos

After reading the fine article, "Stainless, Zinc Hold Trim Market" (Apr. 20, p. 65), I recomputed the table of poundages by car, weighting by the first quarter, 1959, production. I thought the revised company and industry averages might be of interest in that stainless steel compares more favorably with other materials when adjusted for production by make. The revised averages are:

	Zinc	Stainless	Aluminum
GM	60 lb	36 lb	43 lb
Ford	61	27	60
Chrysler	44	31	70
Industry	58	32	51

R. A. Pitcairn
Corporate Development Section
Crucible Steel Co. of America
Pittsburgh

A Rare Opportunity

I've just read your short, pithy editorial, "Nine Week Steel Strike?" (Apr. 20, p. 45).

It seems to me that there is a rare, once in a lifetime opportunity for the steel industry to take a patriotic stance and gain great prestige by announcing a price *reduction* of $1 or $2 per ton. I

(Please turn to Page 12)

TON FOR TON . . . DOLLAR FOR DOLLAR

OBI value and savings that can't be matched

FEATURING NIAGARA'S FAMED MULTI-POINT MECHANICAL SLEEVE CLUTCH

Picks up load on 14 engaging jaws. Applies driving force concentrically without keys or pins. Assures instant engagement and maximum productive strokes per minute. Needs no air nor electricity. Practically no maintenance. Greater safety: Simplified controls, fewer parts to wear out. *Yes, it permits, inching, too.*

1¼ - 6½ inch shaft diameters

5½ - 150 ton capacities

Here's a workhorse that's known for setting the pace on the most demanding jobs... jobs where the clutch is engaged and disengaged at every press stroke... jobs that call for operation three shifts a day, day in and day out.

Built and *backed* by a company which produces industry's greatest variety of inclinables*, Series A Presses have amassed an unusual success record in thousands of applications. To be specific, let's take a close look at a Series A user:

28 OBI'S SINGLE STROKED 707,140,000 TIMES
WITHOUT ONE CENT SPENT ON CLUTCH ENGAGING SURFACES

Automatically fed for single stroking operations, 28 Series A Presses have produced 707,140,000 parts in the plant of a renowned appliance manufacturer since 1950. Clutches have required but $123.30 in replacement parts. No engaging surfaces have been replaced on any press. Examination shows no measurable wear. Original machining marks still visible.

GET THE FULL REPORT

Write for the complete, documented job study, "707,140,000 Clutch Engagements," as well as Bulletin 58 containing data and specs on Niagara's remarkable line of Series A Inclinables.

*Note: Niagara also builds single and double crank OBI's with Electro-Pneumatic Friction Clutches and Electro-Pneumatic Sleeve Clutches to meet every need. *You name it!*

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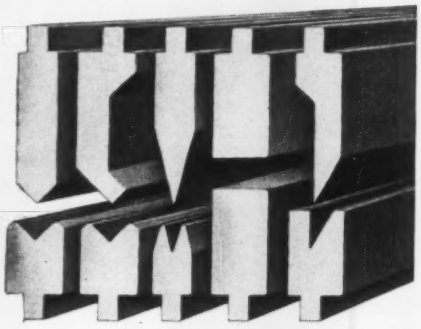

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This organization of local distributors offers immediate delivery on many CHICAGO *induction hardened* press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

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On your needs for press brake dies, call your nearest distributor listed here. With Bulletin D-457 you can order by number. Ask for a copy.

*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO *induction hardened* dies show up to ten times longer life than conventional press brake dies.

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LETTERS

(Concluded from Page 10)

think such a strategic (and surprise) move at this time would:

1. Prevent a strike.
2. Put the nation's No. 1 basic industry in a position of leadership in the fight against inflation.
3. Prevent the loss of millions of dollars in wages and earnings.
4. Conform to the President's appeal that some responsible segment of our economy take the lead to halt inflation, even at some sacrifice.
5. Deflate some of the so-called biggest names among labor leaders.
6. Be a good, belt tightening gesture and help meet the ever increasing problem of foreign competition.

The industry may say that an offer to reduce prices of finished steel without an increase in wages would nullify its contention that earnings are not unreasonable in relation to other industries.

However, there is more at stake than the immediate necessity of nullifying the industry's contention with regard to earning comparisons. At stake is stopping the vicious inflationary spiral. At stake is to find a large and influential industry which is willing to make some sacrifices in the interests of the entire country. At stake is the necessity for some dramatic and forceful recognition of foreign competition. At stake is real business leadership under our democratic system.

Let us suppose that this unique move results in a temporary reduction of earnings for the industry. Is that worse than uncontrolled inflation, a nasty strike, increased foreign competition? Is that worse than a major industry "me-tooing" and failing to provide leadership at a time when it so important to the country as a whole?

Richard S. Smith
President
Rigidized Metals Corp.
Buffalo

Fast Steelmaking Interest High

"From Iron Ore to Steel in 35 Minutes" (Apr. 27, p. 100) is of considerable interest. May we have three additional copies?

Francis D. O'Leary
Director of Purchases
Louis Berkman Co.
Steubenville, Ohio.

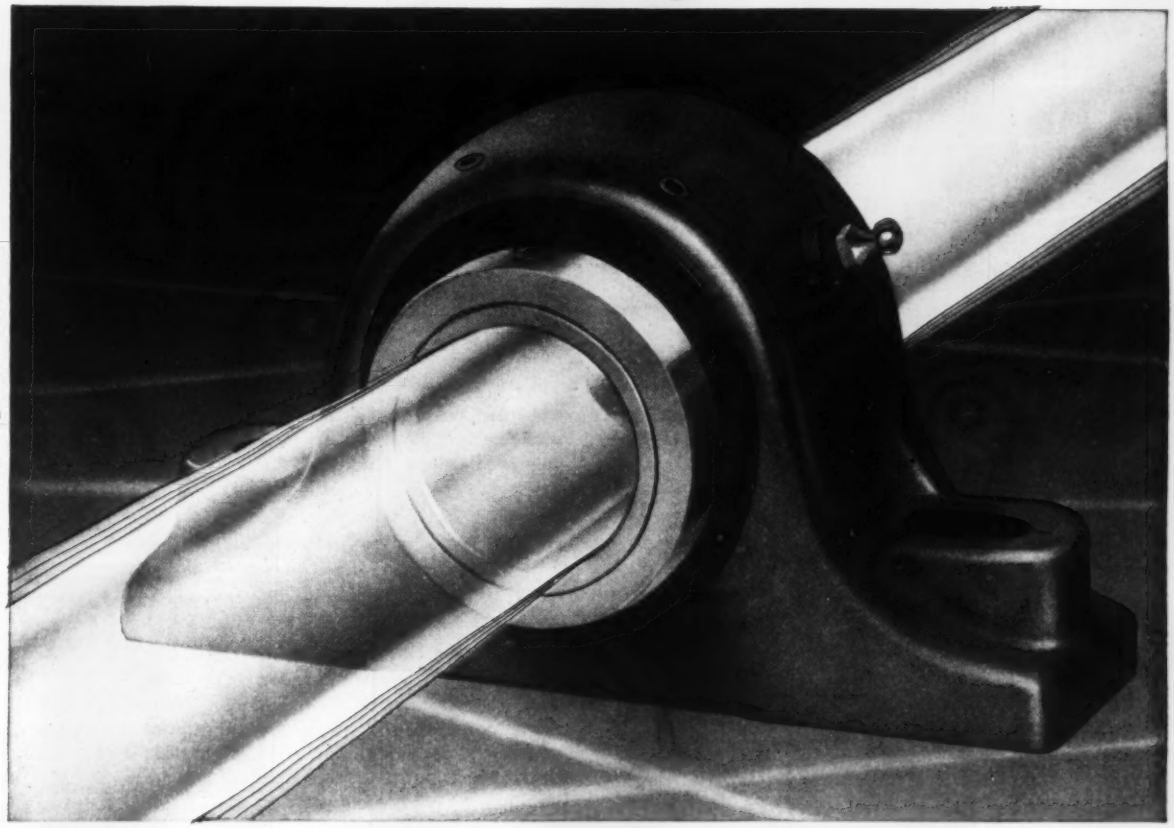
Decimal Misplaced on Sulfur

In "From Iron Ore to Steel in 35 Minutes" you show an analysis of the steel. It has a rather high sulfur content (0.21 per cent). This seems unusually high even for the Arizona ore you mention. Will you check this figure?

R. E. Minto
Jones & Laughlin Steel Corp.
Cleveland

• *On rechecking, we find the figure should have read* 0.021.

Free rolling . . . long lasting because it's *Self-Aligning*



Link-Belt roller bearings compensate for misalignment of shafts and supports

Link-Belt Series 400 roller bearings have won a reputation as "the designer's choice." These self-aligning, double-row roller bearings compensate for inaccuracies in machining and assembly of equipment while maintaining full load capacity throughout their long life. Their compactness promotes simplicity of machinery design—their easy mounting reduces installation costs.

For complete information on the Series 400 —and Link-Belt's complete line of ball and roller bearings—send for our Book 2550. It's available at any one of the 40 Link-Belt offices or your authorized stock-carrying distributor.

Look under BEARINGS in the yellow pages of your phone book.

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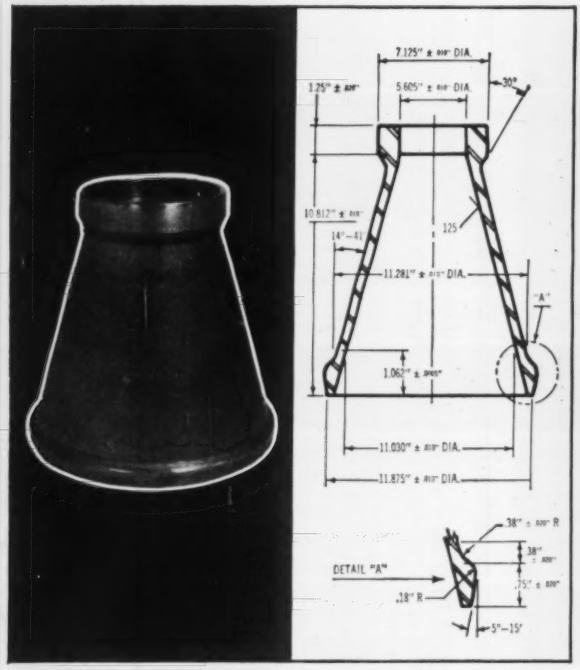
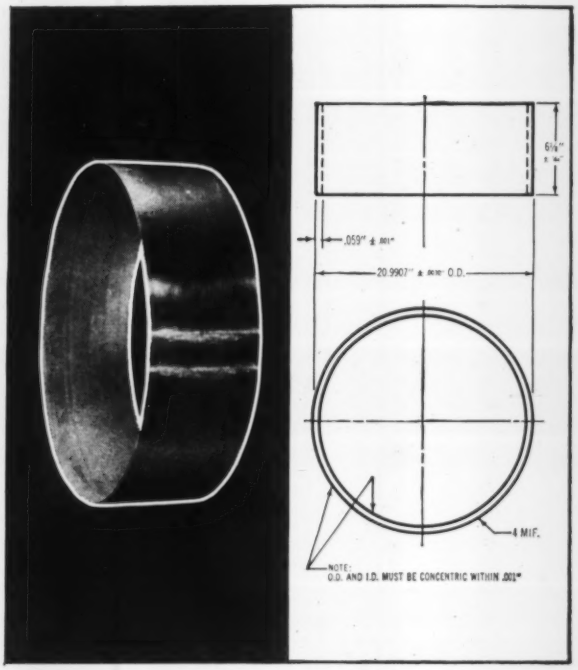


STRAIGHT SIDE ROCKET CONE—Spun with tapered wall from 1020 steel blank: 18" diameter, 1" thick. Inside surface 125 MIF.



STRAIGHT WALL TUBE PRINTING BAND—Spun from ⅛" thick aluminum to .060" wall thickness, outside surface machine finished to 4MIF.

ROTOFORMS open new

ROTOFORMING reduces cost of unusual metal shapes—saves metal, eliminates machining and surface finishing

The design possibilities for hollow metal shapes are now unlimited. The most unusual metal custom parts can be practically and economically produced by ROTOFORMING.

This revolutionary new metal forming service now being offered by COMMERCIAL SHEARING & STAMPING displaces metal in a blank or preform. Rollers contacting the outside surface of the metal form it by high pressure as it rotates around a mandrel. The shape of the mandrel itself, at all times, controls the inside contour and size of the part.

WHAT SHAPES ARE POSSIBLE? Basically, ROTOFORMS can be grouped into four main categories: Straight-Side Cones, Straight-Wall Tubes, Curvilinear-Wall Shapes, and Elliptical or Hemispherical Shapes. Pictured above are representative ROTOFORMS already produced by COMMERCIAL. Principal dimensions are included.

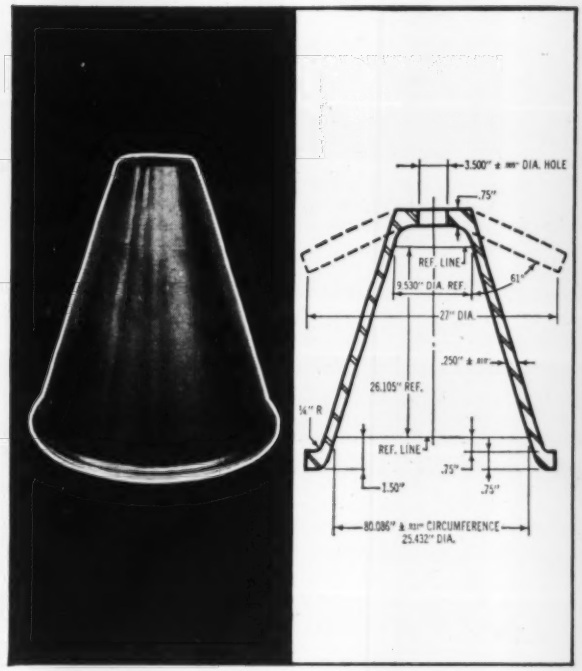
WHAT ABOUT SIZE AND WALL THICKNESS? The range of sizes for ROTOFORMS covers maximum diameters up to 42" down to a minimum tube I.D. of 2¼". Tube length can go as high as 100".

Steel blanks up to ¾" thick can be successfully handled by ROTOFORMING where conical shapes are involved. And when it comes to forming straight-wall tubes the wall thickness of steel blanks can even go up to ⅝". When forming metals more ductile than steel it is possible to work blanks with even greater wall thicknesses than those above.

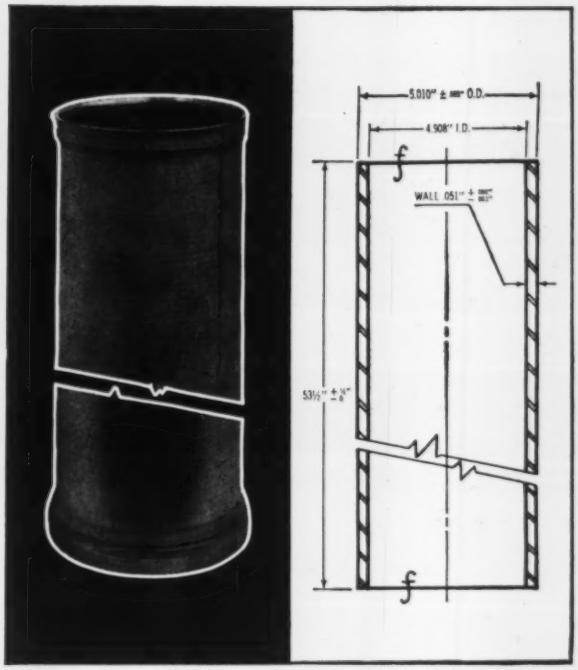
With ROTOFORMS wall thicknesses—both constant and variable—are feasible. Walls referenced to C/L can be straight, curved, or tapered. And ROTOFORMS have been successfully produced with a finished wall thickness no greater than $\frac{1}{32}$".

WHAT METALS CAN BE ROTOFORMED? A wide variety of carbon steels, stainless and special alloy steels, as well as aluminum, nickel, copper, molybdenum, magnesium and titanium alloys can be successfully ROTOFORMED. Even metal alloys such as 4130 steel, 1100-0 aluminum, and hard to machine Hastelloy, can and are being used in the regular production of ROTOFORMS.

WHAT HAPPENS TO THE METAL? The plastic deformation which metals undergo in the ROTOFORMING process elongates their grain structure and sub-



STRAIGHT SIDE MISSILE EXIT CONE—Spun with constant wall thickness from press pre-formed 1040 steel blank: 29" diameter, ¾" thick.



STRAIGHT WALL ROCKET TUBE—Spun from 4135 steel tubing (wall thickness ½") reduced to finished wall .051".

horizons for metal shape design!

stantially increases their strength. Tensile increases 1½ to 2 times, yield point is raised in even higher proportion, and fatigue strength is substantially improved. And ROTOFORMED parts can be heat treated to increase their ductility.

Because of the plastic deformation of metal, involved weld joints become unnoticeable when ROTOFORMED. And there are no hidden metal flaws in ROTOFORMS. Any metal inclusions or flaws in the parent metal are quickly uncovered during the ROTOFORMING process—appear as ruptures when pressure spinning rolls reposition the metal by physical displacement. Only 100% sound metal will produce successful ROTOFORMS.

WHAT ABOUT TOLERANCES AND FINISHES? Extremely close tolerances and tolerances commonly associated with fine machining are routine in the production of ROTOFORMS. It is not uncommon for ROTOFORMED parts taken from the machine as is to have inside diameters held to tolerances of +.000" –.003", +.005" –.000", and +.005" –.005".

Inside areas of ROTOFORMS finish to a glass-like surface—30 to 60 micro inch finishes being well within standard production practice. While outside surfaces finish to about 125 micro inch.

Because dimensional tolerances and inside surface finish have a direct relation to the variation and finish of blank from which the ROTOFORM is produced, when necessary the tolerances of a blank can be reduced and its finish improved beforehand in order to provide closer tolerances and a better inside finish in the actual ROTOFORM. In addition, the outside surfaces of ROTOFORMS can be brought to smoother finish by grinding, polishing or fine machining.

AN INVITATION FROM COMMERCIAL! This new metal forming process could be the practical and economical answer to your particular component problem. You can find out very quickly. Just a blueprint, sketch or prototype of your part in the hands of our engineers will bring you the complete cost-saving story—and at no obligation. Address inquiries to Commercial Shearing & Stamping Co., Dept. L-22, Youngstown 1, Ohio.

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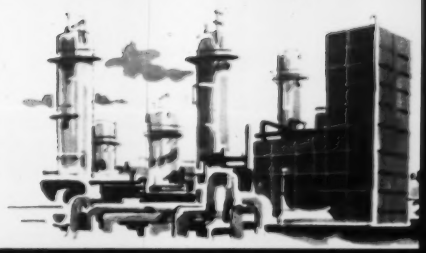

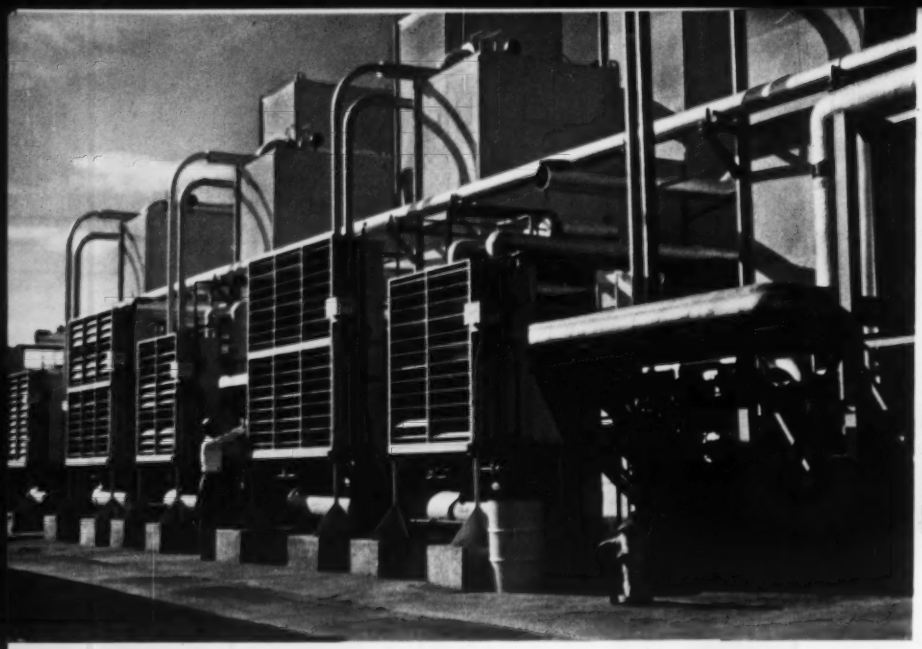

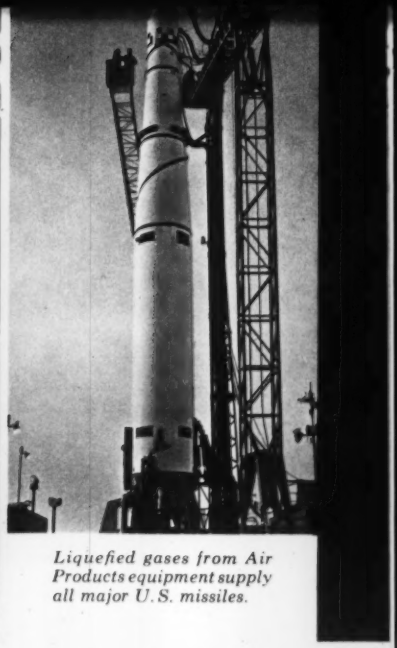

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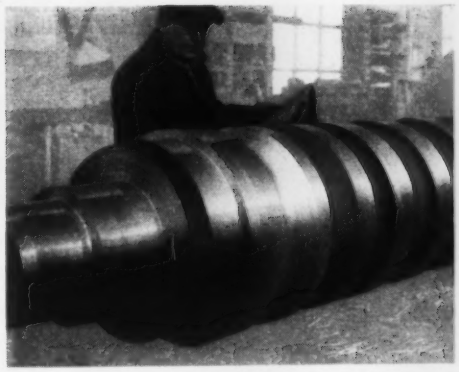

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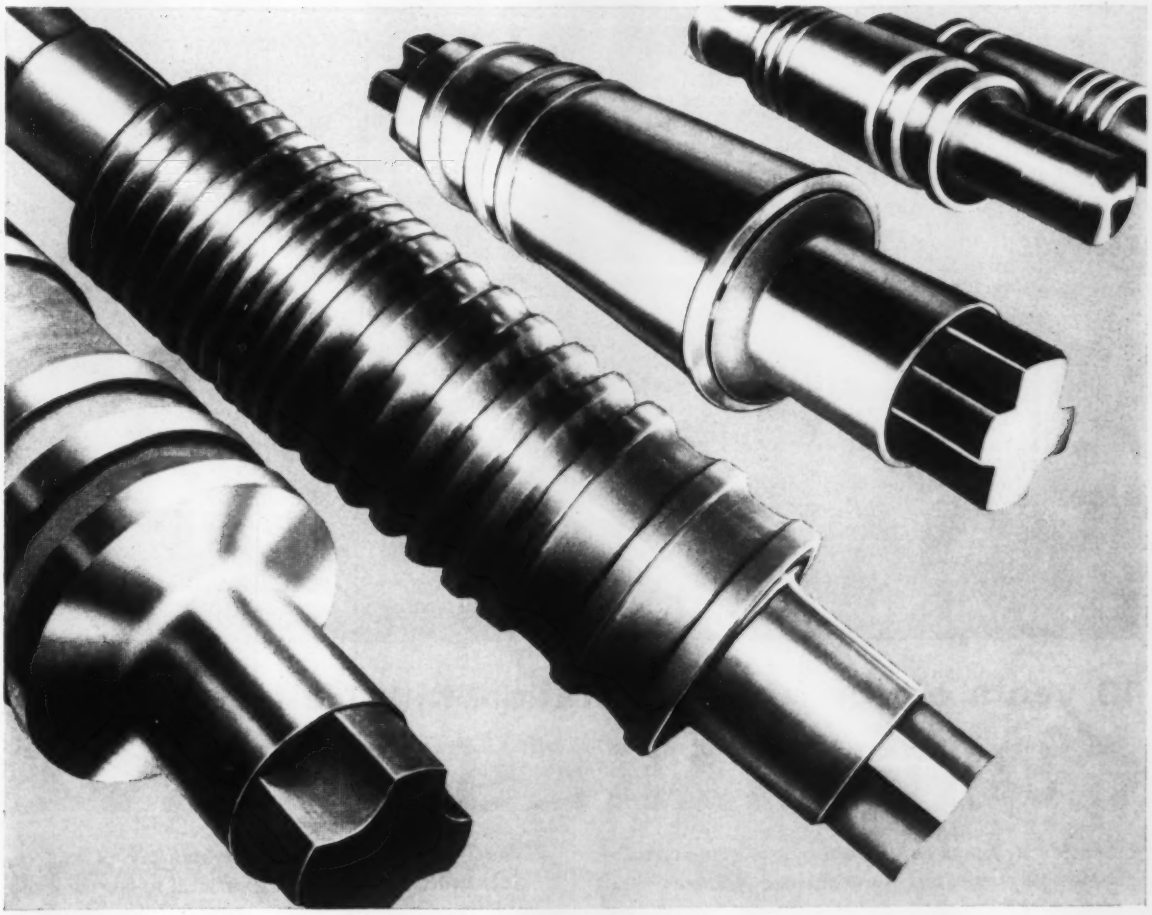

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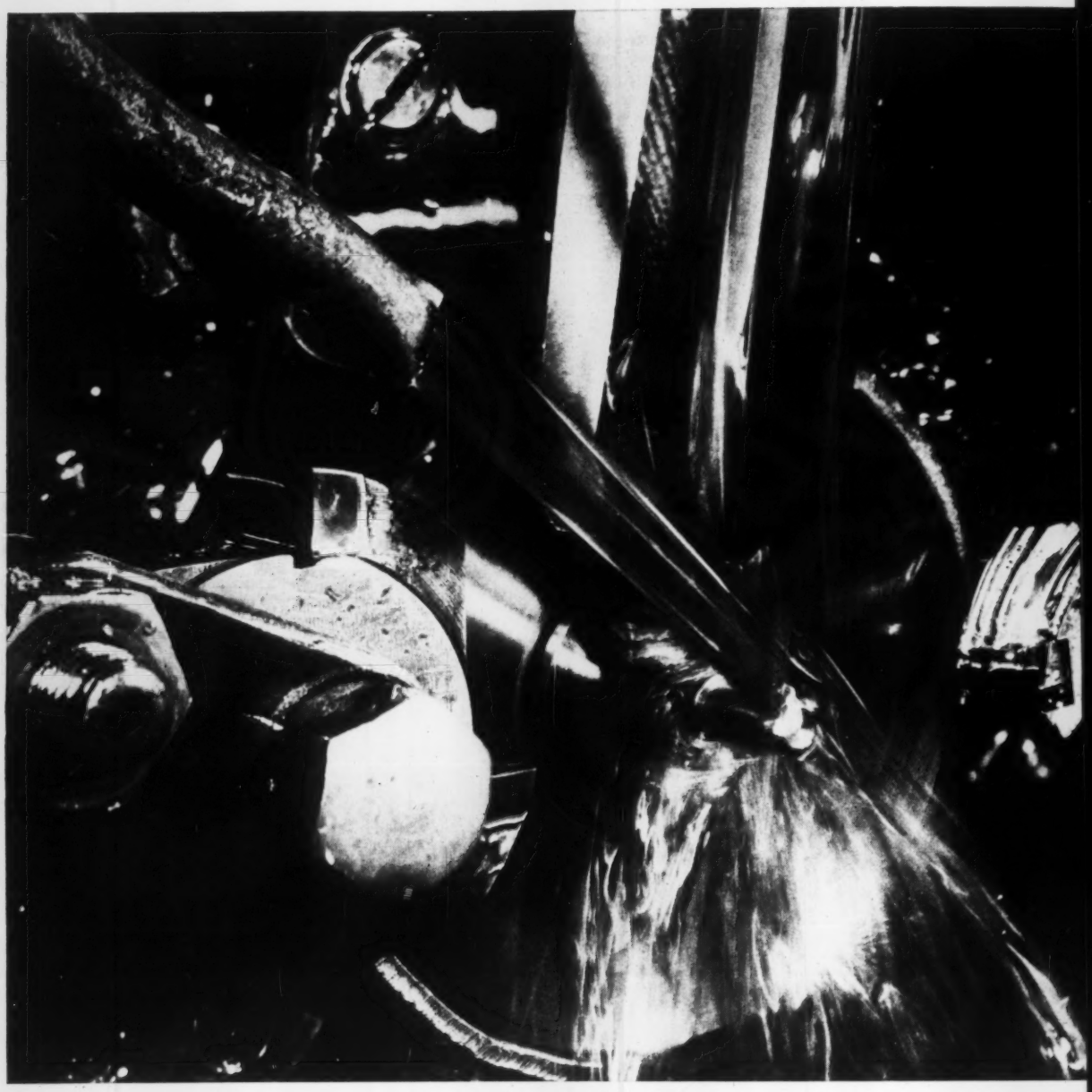

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From movie camera and slide projector components to garden hose nozzles and worm gears for Venetian blinds —no machining job is too different or too tough for Waterbury Machine Tools & Products Company, Inc. of Waterbury, Connecticut.

And no brand of cutting oil gives them the consistently good results they get with Gulfcut oils.

"We've been using Gulfcut for over 10 years on thousands of really tough machining jobs," says Edward H. Somma, Secretary and General Manager of the firm. "Gulfcut has contributed a great deal to our company's success in this highly competitive field."

Closer tolerances. Finer finishes. Higher cutting speeds. Longer tool life. These are the big advantages Mr. Somma finds with Gulfcut. Plenty of proof that Gulf makes things run better!

A typical machining job at Waterbury Machine Tools & Products is illustrated above. Workpiece was a close-

Smooth finish, using Gulfcut at Waterbury Machine Tools & Products Company. Job: Pivot pin for automotive ignition system. Material: ¼" diameter Naval Brass. Depth of cut: .065". Feed: .006 ipr. Machine speed: 4,260 rpm. Tolerance: .002" on back diameter, .0002" on front diameter. Finish: Excellent.

Edward H. Somma, left, Secretary and General Manager of Waterbury Machine Tools & Products Co., with Peter Eaton, Gulf Sales Engineer. Brown & Sharpe miller at right uses Gulfcut Heavy Duty Soluble Oil, chosen because of its better cooling on the wider surfaces of the milling cutter and for longer tool life.

and tough machining jobs, prove

RUN BETTER!

tolerance pivot pin for contact set used in automotive ignition systems. Material was Naval Brass. Gulfcut helped achieve an extremely fine finish at a production speed of 10⅝ seconds for each piece.

See how Gulf makes things run better in *your* shop. Whatever type of machining you do, there's an oil in the complete Gulfcut line to meet each specific need.

Call a Gulf Sales Engineer at your nearest Gulf office, or mail coupon for pamphlet on Gulfcut cutting oils.

GULF

GULF OIL CORPORATION
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Send me pamphlet on
☐ Gulfcut "regular" cutting oils.
☐ Gulfcut Heavy Duty Soluble Oils.

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Company_____
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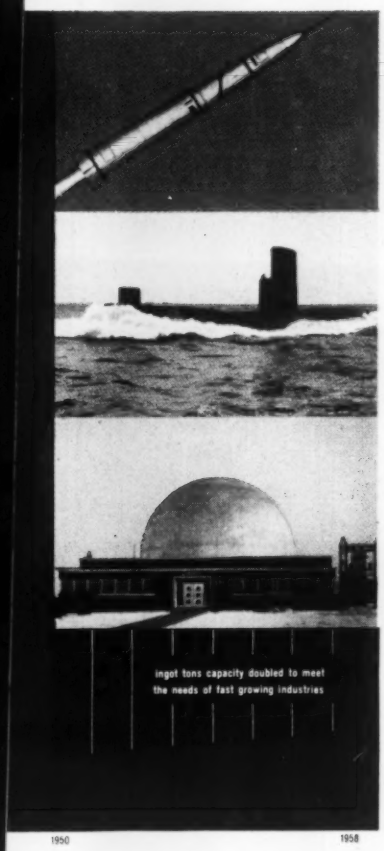
City_____ Zone____ State_____

SM 0118

remember the Duryea ?



It was quite the aristocrat of its day . . . along with the Pope-Hartford, Knox, Locomobile and the Lozier—all gone and nearly forgotten ghosts of a magnificent era.

The motor maker's problem then was not *how to sell* but *how to make*. And to put fresh confidence in the infant industry's first steps, *Carpenter* contributed wondrous new chemistries of steel . . . the first basic automotive alloys.

Since that day, startling discoveries in the *Carpenter* laboratories read like a history of American steelmaking. New steel formulations, quality controls . . . even new steel terminology originated by *Carpenter*, are now standards in steel mills throughout the country.

With this leadership in pioneering and production of the world's finest steels—goes the responsibility of meeting the constantly growing demands of the atomic age—more stainless, more tool steels, more special-purpose alloys. For a company whose history was based on quality rather than quantity, this was quite a challenge.

To meet it, *Carpenter* has *doubled its ingot tonnage capacity within the past year, through the acquisition of steelmaking facilities in Bridgeport, Conn.* New furnaces, mills and finishers—all completely equipped with precise *Carpenter* quality controls—began operation.

Capacity—mass production of specialty steels for critical applications—is an established fact.

In the years ahead, *Carpenter* will continue to lead the way and grow apace of industry's ever-increasing demands for the world's finest specialty steels.

Carpenter steel

tool and die steels
stainless steels
electronic and magnetic alloys
special-purpose alloy steels
valve, heat-resisting and super alloy steels
tubing and pipe
fine wire specialties

The Carpenter Steel Company
Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

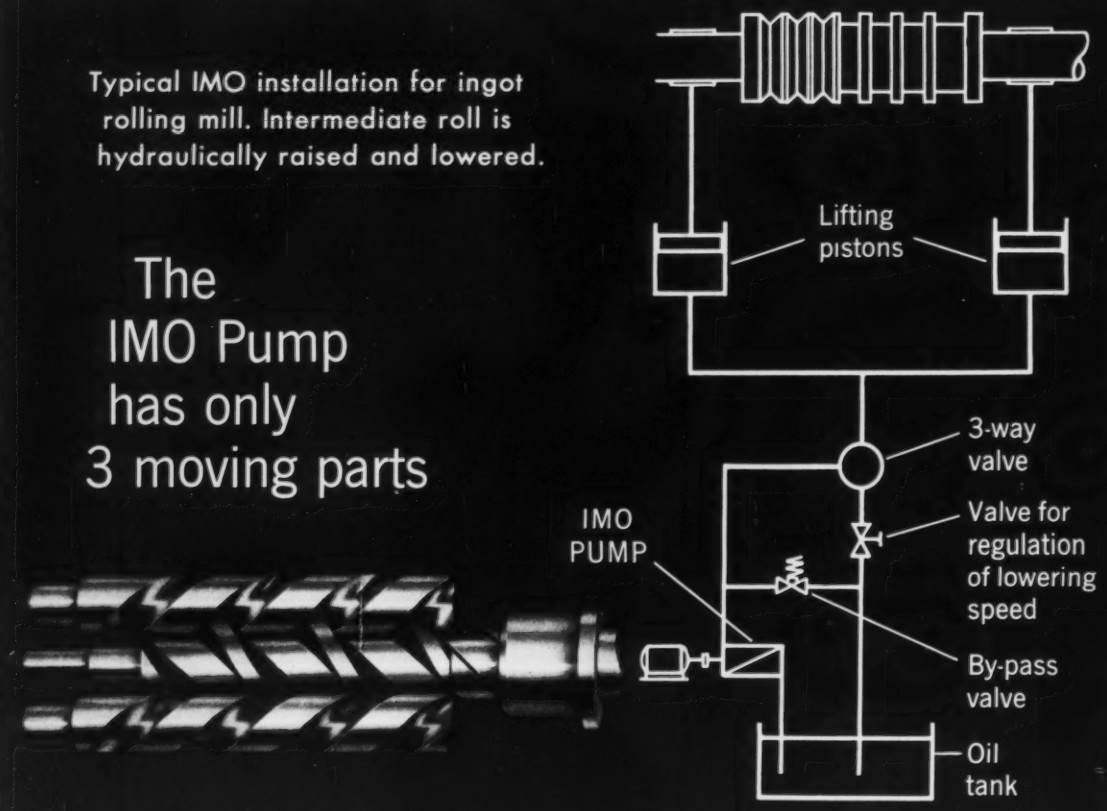
DE LAVAL
IMO PUMPS

for Power Hydraulics

If you require a hydraulic pump for actuating any kind of equipment—lifting, tipping, loading, bending, pressing, etc. —consider the IMO. Here are its characteristics:

- **Smooth power flow without pulsation**
- **Can be direct-driven at high speeds without reduction gears**
- **Thoroughly dependable and proved**
- **QUIET, smooth rolling action**
- **Easily installed**

Typical IMO installation for ingot rolling mill. Intermediate roll is hydraulically raised and lowered.



The IMO Pump has only 3 moving parts

DE LAVAL *IMO Pumps*

DE LAVAL STEAM TURBINE COMPANY
860 Nottingham Way, Trenton 2, New Jersey

DL-455

CALENDAR
OF MEETINGS

May 25-26, Malleable Founders' Society: Annual meeting, Homestead Hotel, Hot Springs, Va. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

May 25-26, Wire Reinforcement Institute Inc.: Annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Institute's address: National Press Bldg., Washington 4, D. C. Managing director: Frank B. Brown.

May 25-27, American Society for Quality Control: Annual meeting and exhibit, Sheraton-Cleveland Hotel and Public Auditorium, Cleveland. Society's address: 161 W. Wisconsin Ave., Milwaukee 3, Wis. Administrative secretary: W. P. Youngclaus Jr.

May 25-28, Design Engineering Show & Conference: Convention Hall, Philadelphia. Information: Clapp & Poliak, 341 Madison Ave., New York 17, N. Y.

May 25-30, Concrete Reinforcing Steel Institute: Annual meeting Greenbrier Hotel, White Sulphur Springs, W. Va. Institute's address: 38 S. Dearborn St., Chicago 3, Ill. Managing director: H. C. Delzell.

May 27-28, American Iron & Steel Institute: Annual meeting, Waldorf-Astoria Hotel, New York. Institute's address: 150 E. 42nd St., New York 17, N. Y. Secretary: George S. Rose.

May 27-29, National Fluid Power Association: Spring meeting, Grove Park Inn, Asheville, N. C. Association's address: 1618 Orrington Ave., Evanston, Ill. Executive vice president: Barrett Rogers.

May 31-June 3, American Gear Manufacturers Association: Annual meeting, Homestead Hotel, Hot Springs, Va. Association's address: 1 Thomas Circle, Washington 5, D. C. Executive director: John C. Sears.

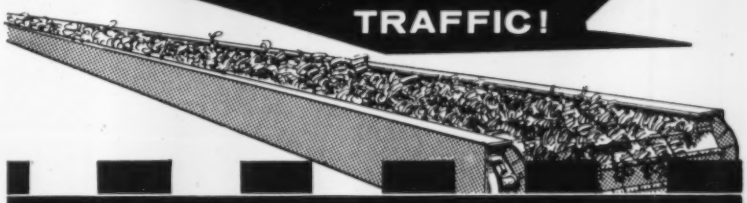
June 2-4, National District Heating Association: Annual meeting, Skytop Club, Skytop, Pa. Association's address: 287 N. Euclid Ave., Pittsburgh 6, Pa. Secretary-treasurer: John F. Collins Jr.

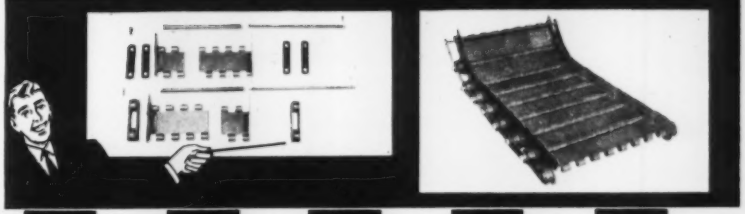
June 9-12, Material Handling Institute Inc.: National exposition of material handling equipment, Public Auditorium, Cleveland. Institute's address: 1 Gateway Center, Pittsburgh 22, Pa. Managing director: L. West Shea.

June 11-12, Pressed Metal Institute: Sales conference, Bedford Springs Hotel, Bedford, Pa. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

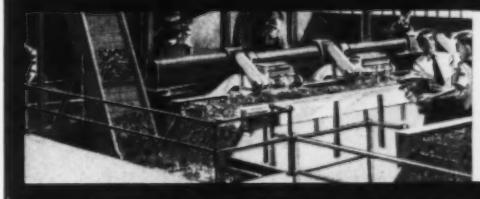
June 13-15, Metal Powder Industries Federation and Powder Metallurgy Committee of the Metallurgical Society, AIME: International conference on powder metallurgy, Hotel Biltmore, New York. Information: Metal Powder Industries Federation, 130 W. 42nd St., New York 36, N. Y.

HERE'S A STEEL HIGHWAY FOR YOUR SCRAP TRAFFIC!





May-Fran Hinged-Steel Belting is assembled from mass-produced components to form a materials handling belting of almost any width, length or contour to meet individual specifications. Links are joined by means of steel rods . . . links, wings and side chain become integral unit.



Belting can be assembled in a wide range of lengths, widths and contours . . . to facilitate the handling of metal scrap, hot forgings, stampings, flash, wet or dry chips as well as other sharp or rough materials.

CHECK THESE FEATURES

- Handles heavy, hot and rough materials
- Engineered for the ultimate in working life
- Constructed for maintenance-free operation

Complete details including specifications and engineering drawings are available in Catalog MF-600. Send today!

7851-MF

MAY-FRAN HINGED-STEEL BELTING GIVES PRODUCTION SAVINGS THROUGH SCRAP HANDLING EFFICIENCY

Precision formed steel links are assembled in horizontal rows and joined by high-carbon steel tubes and connecting rods. These rods are fastened to side chains to support the belt links so they "float" freely, and side chain takes all tension. Wings remain positively engaged and in continuous overlap at all times, even over sprockets.

MAY-FRAN ENGINEERING, INC.

1725 Clarkstone Rd., Cleveland, Ohio

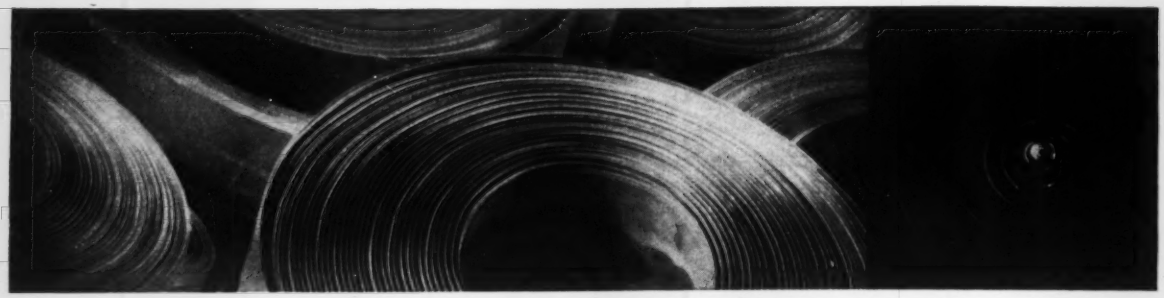
Please send me (free) MF-600

Name_____

Title_____

Company_____

City_____ Zone____ State____



Check your requirements against these Wallace Barnes Cold-rolled Specialty Steels

Furnished in these carbon grades:

1.25 – 1.32% .90 – 1.05% .70 – .80% .59 – .74% .48 – .55%

ANNEALED AND HARD-ROLLED

Thickness

.003 – .010″	in widths	1/8 to 6 1/4″	
.011 – .014″	" "	3/16 to 11″	
.015 – .019″	" "	3/16 to 13″	
.020 – .035″	" "	1/4 to 13″	
.036 – .049″	in widths	3/8 to 13″	
.050 – .064″	" "	1/2 to 13″	
.065 – .093″	" "	3/4 to 6 1/4″	
.093 – .125″	" "	3/4 to 6 1/4″	

HARDENED AND TEMPERED

Scale-free or scaleless; polished*; polished and blued*; polished and strawed*

Thickness

.003 – .004″	in widths	1/8 to 2″	
.005 – .007″	" "	1/8 to 3″	
.008 – .009″	" "	1/8 to 4″	
.010 – .014″	" "	3/16 to 5″	
.015 – .019″	" "	3/16 to 7″	
.020 – .025″	" "	1/4 to 8 1/2″	
.026 – .030″	" "	1/4 to 8″	
.031 – .035″	in widths	1/4 to 7″	
.036 – .040″	" "	3/8 to 7″	
.041 – .049″	" "	3/8 to 6″	
.050 – .060″	" "	1/2 to 4″	
.061 – .064″	" "	1/2 to 3″	
.065 – .093″	" "	3/4 to 3″	

*Maximum width for polishing in .010 – .030 thickness ranges is 5 in.

Facilities for processing alloy steels also are available.

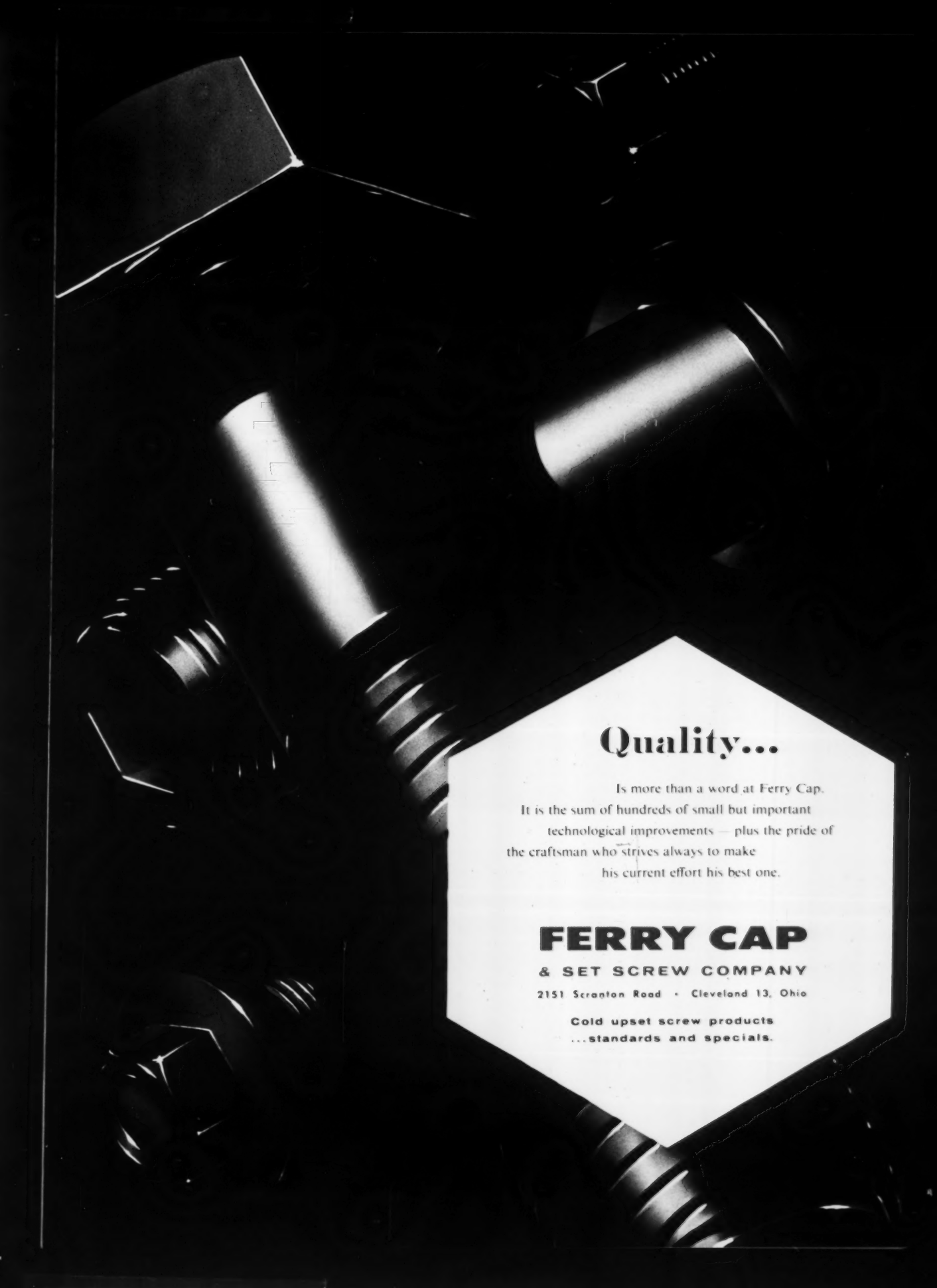
Standard sizes normally available for prompt shipments.

Write for a copy of "Physical Property Charts" that give performance characteristics of .90 – 1.05% and .70 – .80% carbon grades.

Wallace Barnes Steel Division

Bristol, Connecticut

Associated Spring Corporation


Quality...
Is more than a word at Ferry Cap.
It is the sum of hundreds of small but important
technological improvements — plus the pride of
the craftsman who strives always to make
his current effort his best one.
FERRY CAP
& SET SCREW COMPANY
2151 Scranton Road • Cleveland 13, Ohio
Cold upset screw products
...standards and specials.

STEELWELD SHEAR
Serves TOUGH JOBS Well

Shearing a ¼" x 6'-0" x 20'-0" steel plate which rides on ball-bearing-capped stanchions. This is a Series 8D-12 Steelweld Pivoted-Blade Shear.

A part of an order of 120,000 gussets cut on the shear.

FOR several years a Steelweld Shear has been in operation at the Drake Steel Supply Co., Los Angeles, California. Most of the time it has been worked on a 16-hour-a-day schedule. It is used for a wide variety of shearing, mostly on 3/16-inch and ½-inch steel plate.

The machine has proven itself on all sorts of shearing jobs. A particularly tough one was the cutting of 120,000 small odd-shaped gusset plates. These were of three sizes and cut three to six at a time of ½-inch steel. The work jarred the shear terrifically, but because of its heavy construction, did not affect it in any way.

Considering the volume of work and hard service, the knives hold up very well. They need be turned only about once every six months.

Write for free copy of catalog No. 2011

STEELWELD

Mechanical and Hydraulic

SHEARS PIVOTED BLADE

Steelweld Machinery includes: Mechanical & Hydraulic Shears and Press Brakes, One-, Two- and Four-Point Straight-Side Presses, Speed-Draw Presses.

THE CLEVELAND CRANE & ENGINEERING COMPANY · 7858 EAST 282nd STREET · WICKLIFFE, OHIO

beauty is stainless steel

Look for the beauty of Stainless Steel on your new automobile. Its bright finish will make your car look better, stay in style longer and have a higher trade-in value.

No other metal offers the freedom of design and fabrication, economy of care and the durable beauty that serves and sells like Stainless Steel.

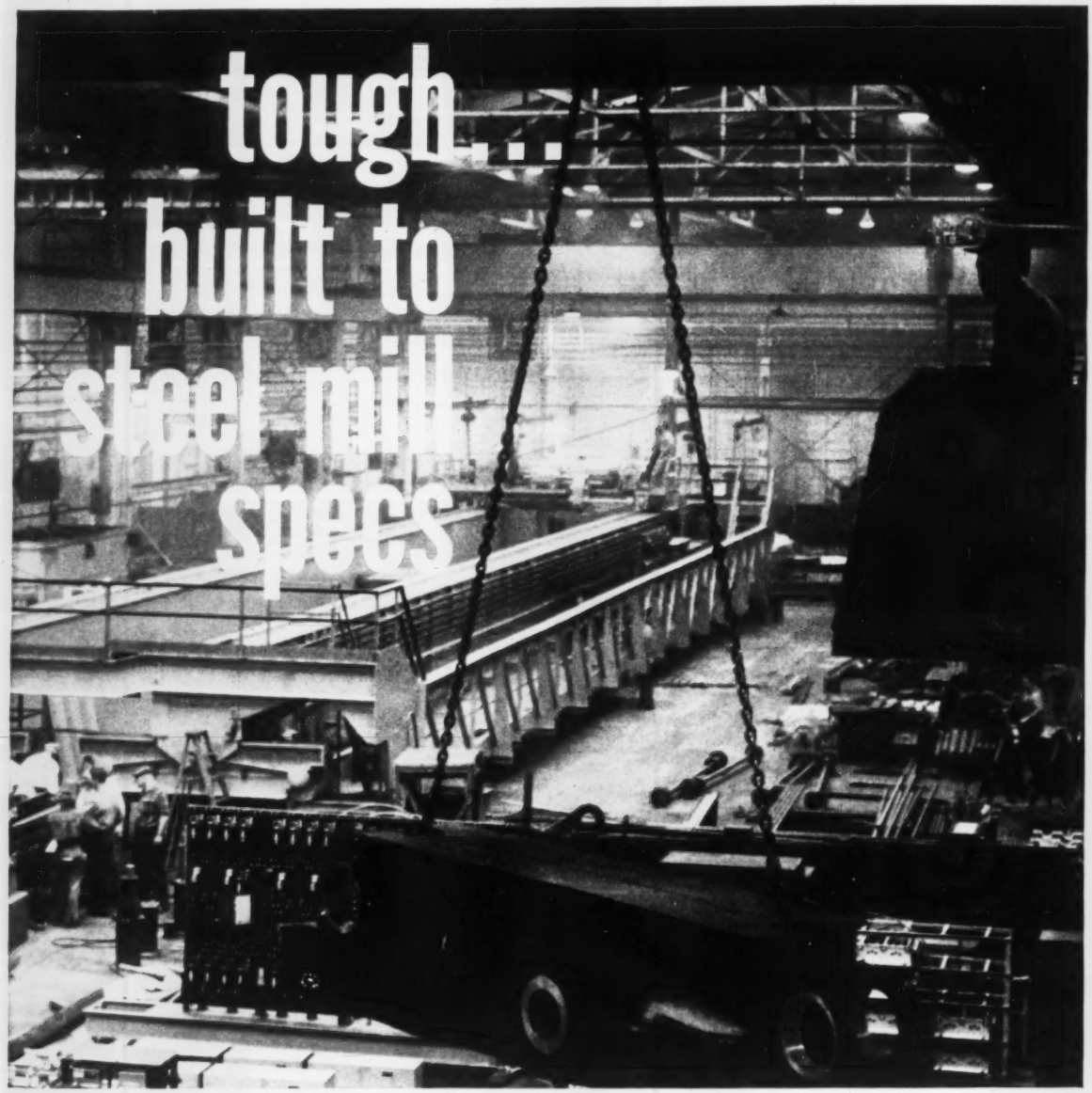
McLOUTH STEEL CORPORATION, Detroit 17, Michigan

specify

McLOUTH STAINLESS STEEL

HIGH QUALITY SHEET AND STRIP

for automobiles



This tough 30-ton Whiting Tiger Crane with a 125′ span is thoroughly checked out on the assembly floor . . . then it's off to rugged, round-the-clock steel mill service. Whiting cranes for mill service easily meet the highest set of standards in all industry, A.I.S.E. specs, or are built to exacting customer requirements. And important Whiting extras like oil bath lubrication, herringbone gears, and long life antifriction bearings assure added years of efficient, dependable maintenance-free operation.

Whiting is your answer to every overhead handling problem. Write for the facts on "Whiting-Engineered Cranes," bulletin 80. *Whiting Corporation, 15643 Lathrop Avenue, Harvey, Illinois.*

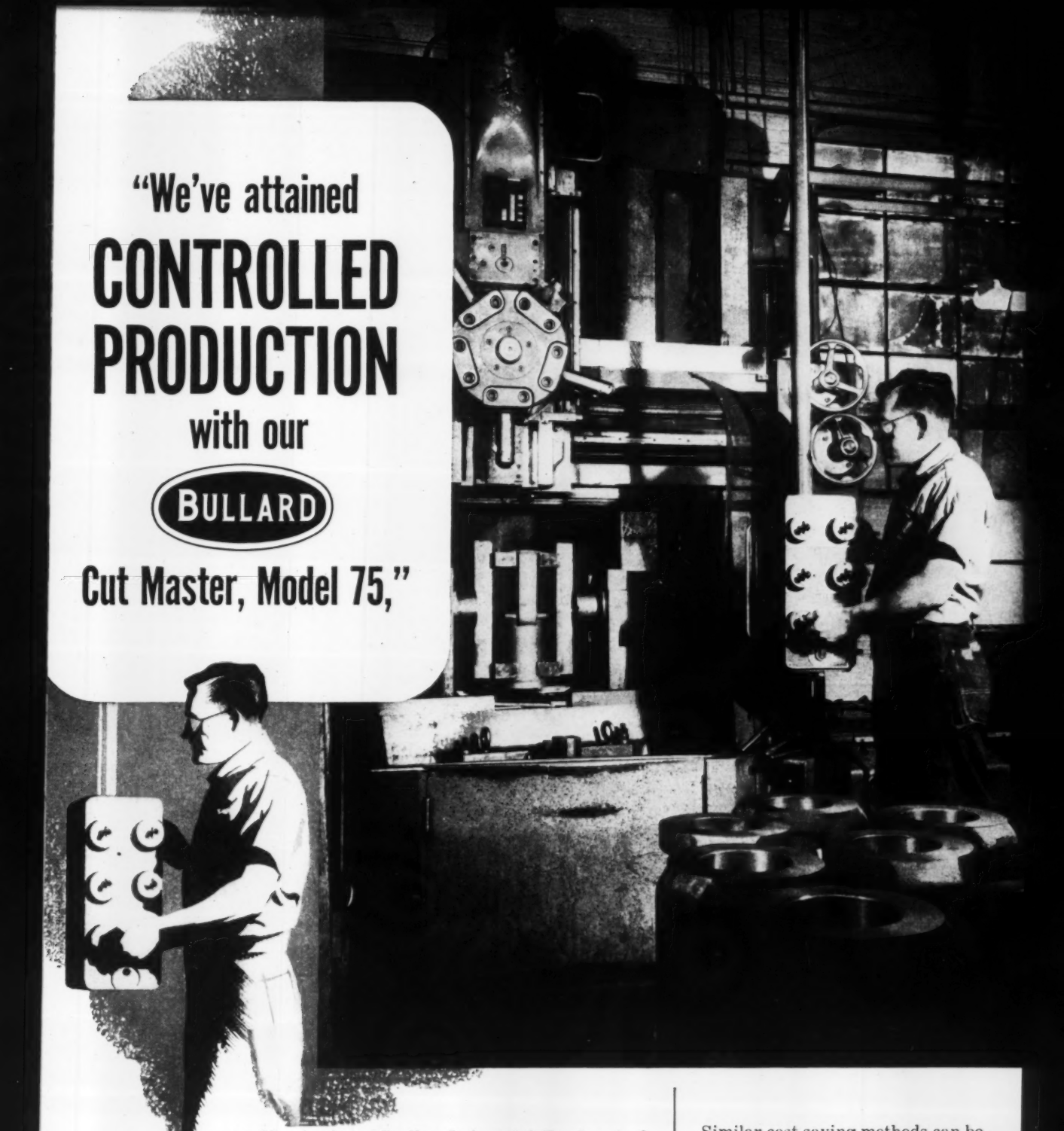
75th year

COST-SAVING EQUIPMENT . . . THE WAY TO HIGHER PROFITS

CRANES

WHITING

MANUFACTURERS OF CRANES, TRAMBEAM HANDLING SYSTEMS, TRACKMOBILES, FOUNDRY, RAILROAD, AND SWENSON CHEMICAL EQUIPMENT



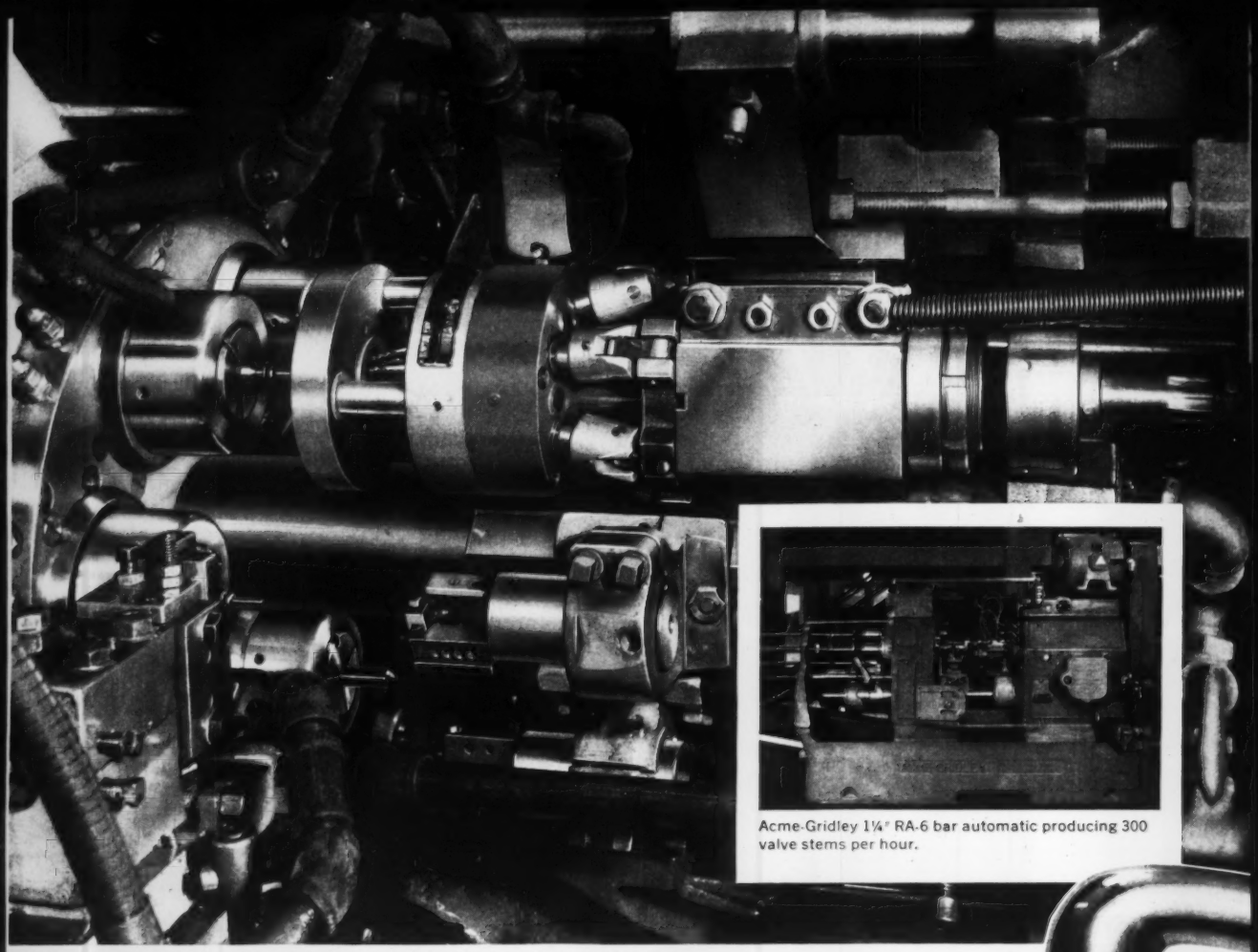
"We've attained CONTROLLED PRODUCTION with our BULLARD Cut Master, Model 75,"

says Mr. Anthony Scelba, Industrial Engineer of Leslie Co., Lyndhurst, New Jersey, manufacturers of regulators and controllers for industrial and marine steam systems.

Combining a specially designed indexing fixture, which permits indexing the piece in increments of 45° and with the automatic features of Cut Master, every piece leaving the machine is completely finished on all surfaces. This reduces the number of set-ups, for instance, on a four way valve from four set-ups to one. In this manner, production is controlled and a minimum inventory required.

Similar cost saving methods can be applied to your machining problems just call your nearest Bullard Sales Office or Distributor.

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT



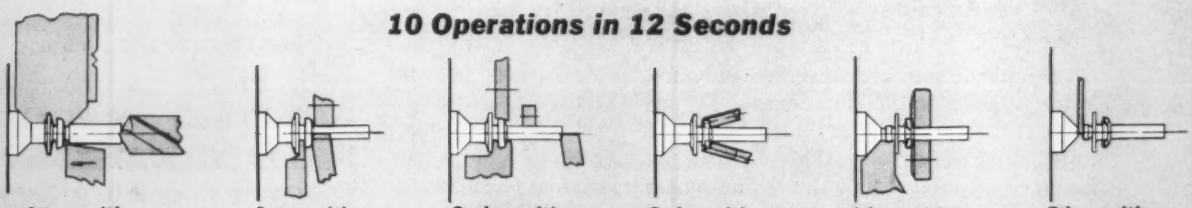
Special Namco-designed multiple end milling attachment in the 3rd position.

Acme-Gridley 1¼" RA-6 bar automatic producing 300 valve stems per hour.

When Tolerances and Finish
Looked Economically Impossible

AMERICAN-STANDARD TURNS TO ACME-GRIDLEY...

10 Operations in 12 Seconds



6th position
Rough form rear
—rough turn stem
—spot drill

1st position
Finish turn stem
face large diameter

2nd position
Shave—face and
chamfer stem end

3rd position
Stop spindle—
mill six slots

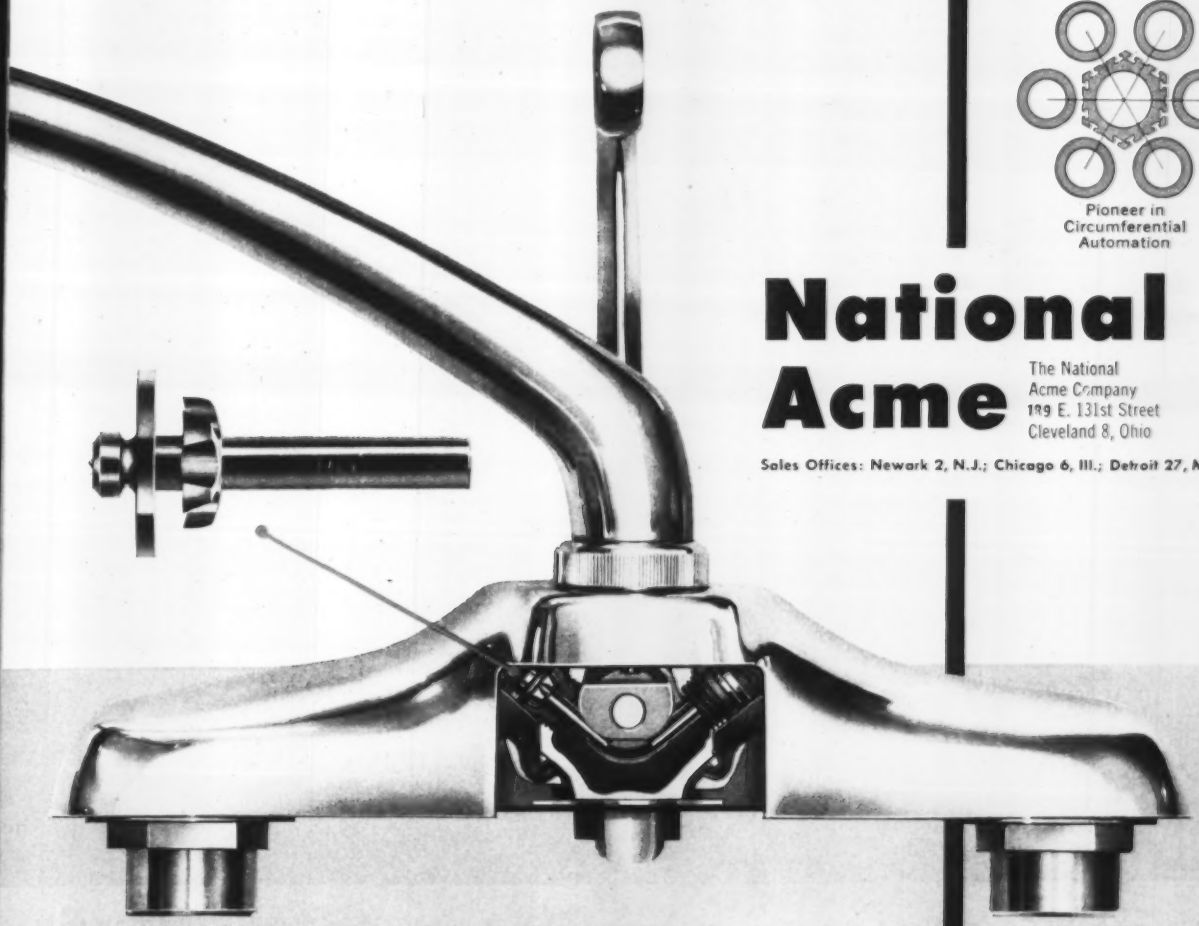
4th position
Start spindle—
burnish stem—
form back end

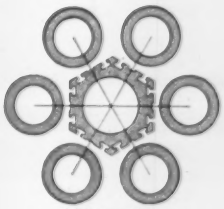
5th position
Cutoff

COMPLETED IN A SINGLE SETUP . . . this hyseal valve stem is a vital component in American-Standard's single-lever mixing faucet. Production by other processes would have meant a two-piece assembly. It would have been economically impossible to meet the high standard of quality and exacting tolerances maintained on this company's products.

Ten operations, including multiple end milling of six half-holes on a 15° angle, were performed on this 303 stainless steel piece in 12 seconds. Rigid specifications required a 20 microinch finish and limits of .002 t.i.r. between seating surface and end of valve stem.

Advanced spindle stopping design and the inherently accurate indexing of Acme-Gridleys, assure proper alignment of the work with the standard and special tool attachments. This, together with wide open tooling zones and independently operated tool slides, helps assure the solution of "impossible" jobs at National Acme. Write or ask one of our representatives for the complete story on the industry's most modern approach to your cost reduction problems.





Pioneer in Circumferential Automation

National Acme

The National Acme Company
199 E. 131st Street
Cleveland 8, Ohio

Sales Offices: Newark 2, N.J.; Chicago 6, Ill.; Detroit 27, Mich.

REPUBLIC GALVANNEALED SHEETS prevent rust problem in dehumidification systems

Units designed to raise or lower the relative humidity of the air, operate through the evaporation or absorption of moisture. These processes naturally require careful choice of materials to prevent formation of rust within the units.

The Air Conditioning and Drying Division, Surface Combustion Corporation, Toledo, Ohio, has solved the problem of corrosion in KATHABAR® units of its manufacture through use of Republic Galvannealed Sheets for coil tube sheets. These tube sheets are punched and extruded, then flanged, to provide for insertion of the finned tubing.

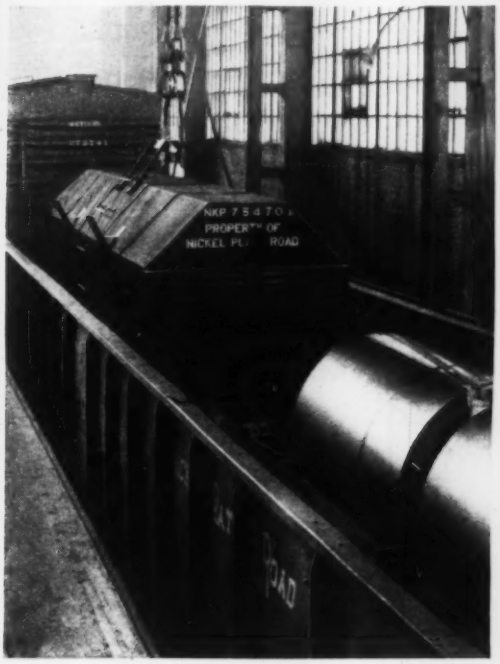
Surface Combustion Corporation is highly satisfied with Republic Galvannealed because it easily takes all these forming operations, and still provides dependable strength and long, reliable service, with rust problems held to an absolute minimum.

Republic Galvannealed has a proved record of performance in thousands of other difficult product applications. Its tight, uniform zinc coating, furnace fired for further resistance to rust and corrosion, will take all ordinary forming operations. It can be sheared, blanked, pierced, formed, flanged, soldered, deep drawn, beaded, and Pittsburgh Lock Seamed with ease. It also provides both initial and long-term economies.

Your Republic representative will be glad to discuss the many advantages of Republic Galvannealed Sheets in relation to your specific product or production requirements. Contact him today, or mail coupon for further information.

REPUBLIC NYLOK® STUDS solve fastening problem for Gravely Tractors, Inc., Dunbar, West Virginia. Problem: Find a dependable fastening method for tractor-attached rotary cultivators. Fastener must withstand constant shocks and pounding of rotary cultivating. Solution: Use Republic Nylok Studs. A special nylon insert assures positive locking at any position, even under severe shock, vibration, tension. Prevents all play. Utilizes metal-to-metal contact of opposing threads for locking. Republic Nylok Fasteners—studs, nuts, cap screws—resist heat, cold, moisture. Can be re-used. Mail coupon for full facts.

REPUBLIC COLD DRAWN ALLOY BARS SOLVE KING-PIN PROBLEM in White Motor Trucks. In maintaining the safety of these trucks, their drivers, and the millions of dollars worth of merchandise they carry each year, White produces critical king pins of 1⅞" round Republic 8620 Alloy Cold Drawn Bars. Republic Cold Finished Alloy Steels are available in every standard analysis, plus many specials. For further information, mail coupon.



REPUBLIC COIL COVERS PREVENT WEATHER DAMAGE in shipping steel coils by rail. In addition to providing excellent weather protection, Republic Coil Covers shut out dirt, stop vandalism, eliminate costly replacement of short-lived tarpaulins, and eliminate need for paper wrappings. Republic Coil and Car Covers are 22 feet long, 6 feet high. Two covers are used with each 52-foot gondola car, easily handled by overhead or trackside crane. Designed for stacking. Send coupon for more shipping protection facts.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. ST-7748
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send additional information on the following:

☐ Galvannealed Sheets ☐ Nylok Fasteners
☐ Cold Finished Alloy Steels ☐ Coil-Car Covers

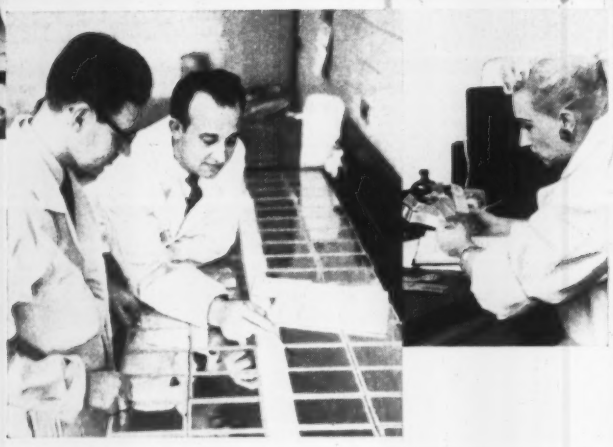
Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

plating leadership ✻



PLATING RESEARCH AT YOUR

world's largest plating supplier

the **udylite**

corporation

detroit 11, michigan

Your plated product has been made more salable, your markets broader, your profits greater thanks to intensive research conducted by Udylite of Detroit. Finishes, processes and solutions now widely in use stem from this research while many plating procedures that are standard had their beginning in Udylite laboratories. Finer, brighter finishes, greater corrosion resistance, increased volume and lowered costs have resulted. Today there is no other single source from which come so many contributions to the plating industry. To provide you with these benefits, Udylite maintains the wholly owned Udylite Research Corporation from which even now still more advances are on their way . . . from Udylite to you.

COMMAND FROM UDYLITE

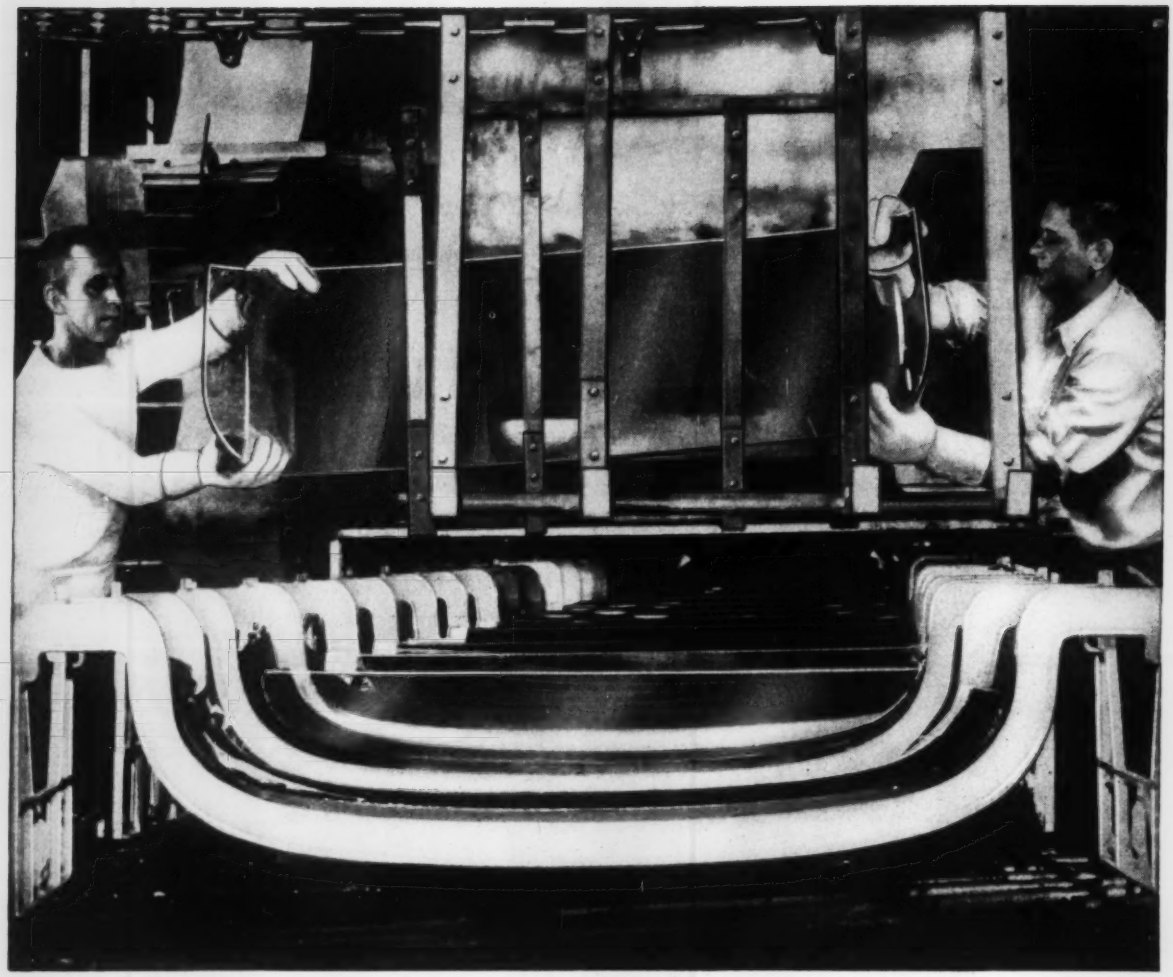
. . . to increase sales and profits

* Continuing Research

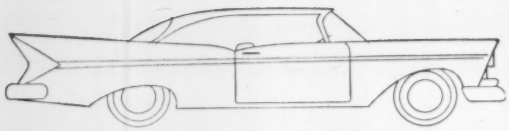
Exposure testing in progress for more than 20 years is but a single phase of Udylite's continuous four point research program carried on in collaboration with industry.

In addition to these tests others are conducted at an oceanside site and test panels are mounted on cars to travel salt-treated winter streets. Similar panels are subjected to every type of accelerated corrosion test for comparison with other findings.

This counterbalance of testing methods furnishes a wealth of authentic data to guide industry toward better products for better service.



Greater visibility, trimmer lines in new car styling... thanks to GAS



With nearly 7,000,000 cars being produced annually, the increased use of glass has demanded major production improvements in the manufacture of new panoramic windshields and back-lights.

Since the forming of the intricately curved glass is done at a temperature at which glass is soft and can be bent, the production process challenged heat process engineers to design new automatic equipment capable of mass producing these large precision glass pieces.

Selas engineers, working with the nation's leading glass manufacturer, discovered that Gas could produce the proper time-temperature cycle demanded by this process, efficiently, quickly, reliably. The flat glass is conveyed under radiant Gas burners which bring the glass quickly up to bending temperature and allow the shaping of windshields, with reproducible uniformity, at high production rates.

The production of this wrap-around windshield is another example of the contributions modern Gas equipment is making to American manufacturing. If you have an operation demanding precise process heating, call your local Gas Company's Industrial Specialist and discuss the economies and results you, too, can get with modern Gas equipment. *American Gas Association.*

See Playhouse 90 with Julia Meade on CBS-TV. Watch local listings for time and station. Sponsored by your Gas Company and the Gas Industry.

New!

Reliance Super 'T' V*S Drives put more power, faster response and greater overload capacity into a 35% smaller package!

New 50 hp. Super 'T' V★S control cabinet compared with 50 hp. old style drive on Reliance production line.

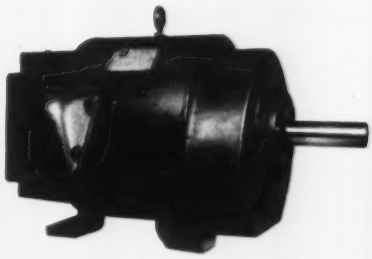
The secret is a new power unit, new controls, and the Super 'T' D-c. Motor

The new Super 'T' power unit packs extra punch into a smaller space. Like the Super 'T' D-c. Drive Motor, it uses Class B insulation and 60°C temperature rise design, permitting 100% overloads. Special control apparatus design has been engineered for the Super 'T' V★S. This systematic balance of power unit, drive motor, and controls forms a single, fast-functioning unit to provide a wide range of variable operating speeds from a-c. circuits.

40 — 150 hp. Super 'T' V★S available for immediate delivery. Contact your local Reliance Representative for delivery schedules of the complete line, 1 — 350 hp.

RELIANCE ELECTRIC AND ENGINEERING CO.

The Super 'T' V★S Drive, a complete power package, provides variable speeds from a-c. circuits



SUPER 'T' D-c. DRIVE MOTOR

OPERATOR'S PANEL

Wide range of operating speeds from a-c. circuits adds flexibility to existing production machinery. Speed changes are stepless and can be varied while equipment is operating or stopped.

Controls

New control relays, both a-c. and d-c. Field tested by three Reliance customers—for over 20 million operations without failure.*

Power Unit

Two-bearing power units are always in alignment, eliminate bearing and coupling problems.

Ventilation

Power unit cooling air is exhausted directly out of cabinet. Provides separate ventilation systems for controls and power unit. Controls are kept cooler, materially extending service life.

Insulation

Power units include new NEMA redesigned d-c. and a-c. machines. Units are smaller. Class B insulation with 60° C temperature rise allows more power in less space.

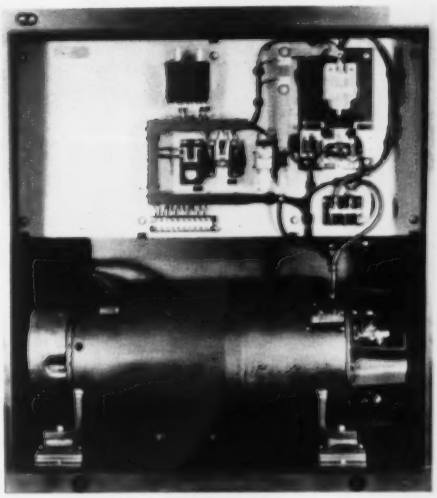
Drive Motor

Super 'T' D-c. Drive Motors give fast response to speed and load changes, take repeated 100% overloads of one minute duration without failure.

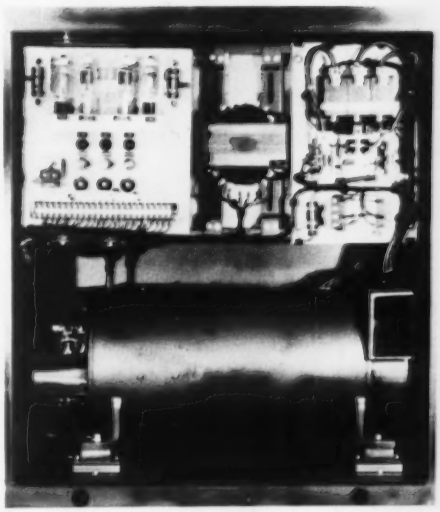
Design

Every component designed for matched performance. New motor controls, new power unit and new drive motor provide balanced operation of production machinery.

*Names on request.



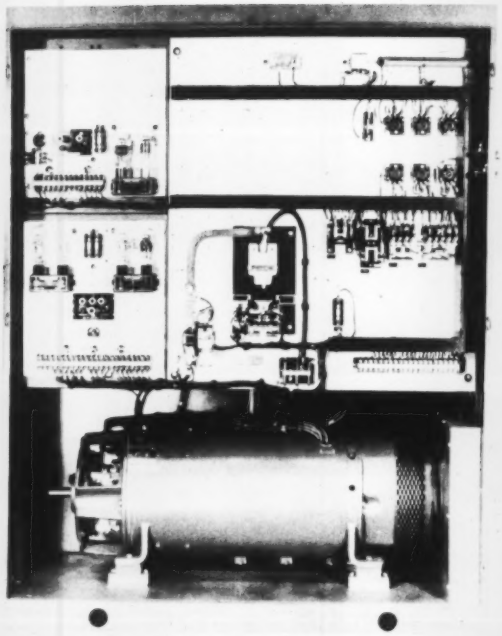
FRONT



BACK

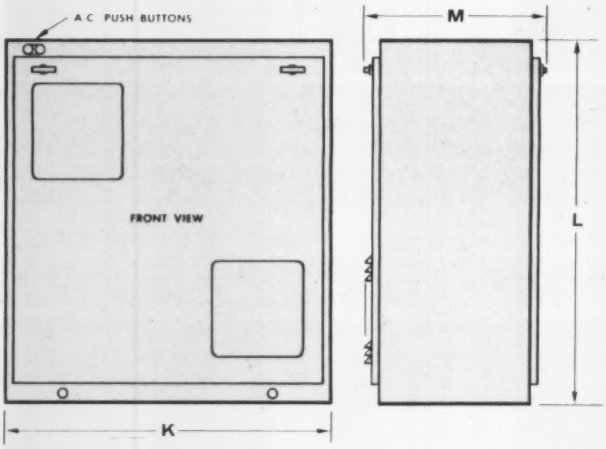
"Custom" Super 'T' V★S Drive for more flexibility, more automatic operation

Every function of the standard model and more. Custom units are designed to incorporate additional controls for engineered installations. Custom models, through the use of feed-back regulation, will provide complete system automation. Control panels are larger to accommodate controls for regulating speed, position, torque and any other operating variables.



Dimensions of Standard Super 'T' V★S Control

FLOOR MOUNTED, 1-150 V★S



Dimensions are in inches and correspond to letters shown.

V★S HP.	CABINET DESIGN	K	L	M
1-15	1SF	35	40	16
20-30	2SF	40	45	20
40-60	3SF	45	50	23
75-100	4SF	55	55	26
125-150	5SF	70	60	30

Product of the Reliance Electric and Engineering Company, manufacturers of a-c. motors, Master Gearmotors, Reeves Drives, Super 'T' D-c. Motors, generators, controls and engineered drive systems.

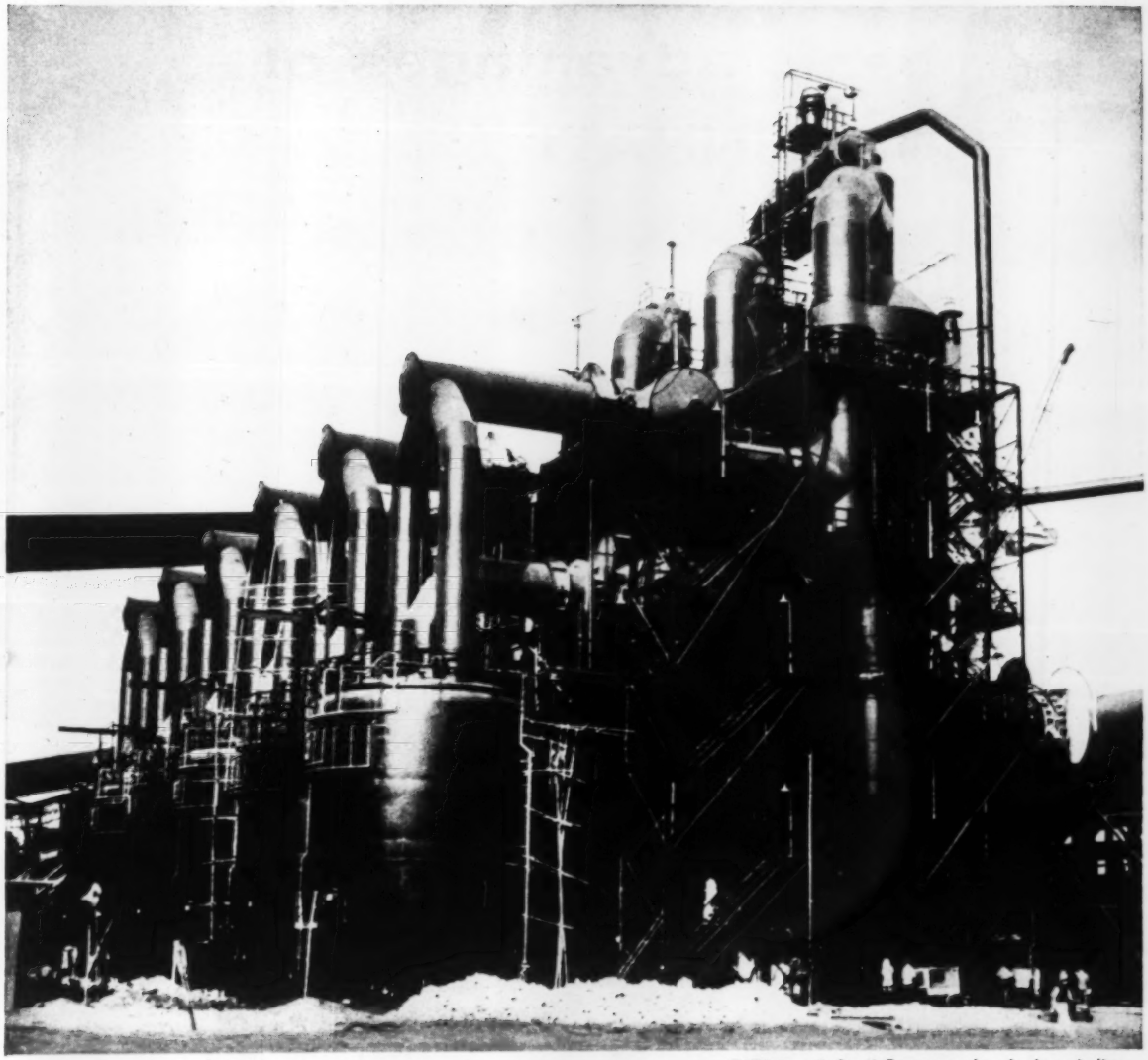
RELIANCE ELECTRIC AND ENGINEERING CO.

CLEVELAND 17, OHIO
Sales Offices and Distributors in Principal Cities
Canadian Division: Toronto, Ontario

MASTER R REEVES

RELIANCE

D-1618 Printed in U.S.A.



TATA Iron & Steel Company, Jamshedpur, India

World's Largest Blast Furnace Precipitator Installation by Research-Cottrell

This huge new electrical precipitator installation is designed to clean 360,000 cfm total gas from three blast furnaces with 96.7% efficiency. The gas is used primarily for preheating the stoves and underfiring coke ovens. It is also used for boiler firing, soaking pits and open hearths. This is part of a new expansion program designed and built by Kaiser Engineers for TATA.

In addition to this new installation, five other Research-Cottrell precipitators still operating at this plant were installed in 1939 to clean 270,000 cfm with 97% efficiency for three blast furnaces.

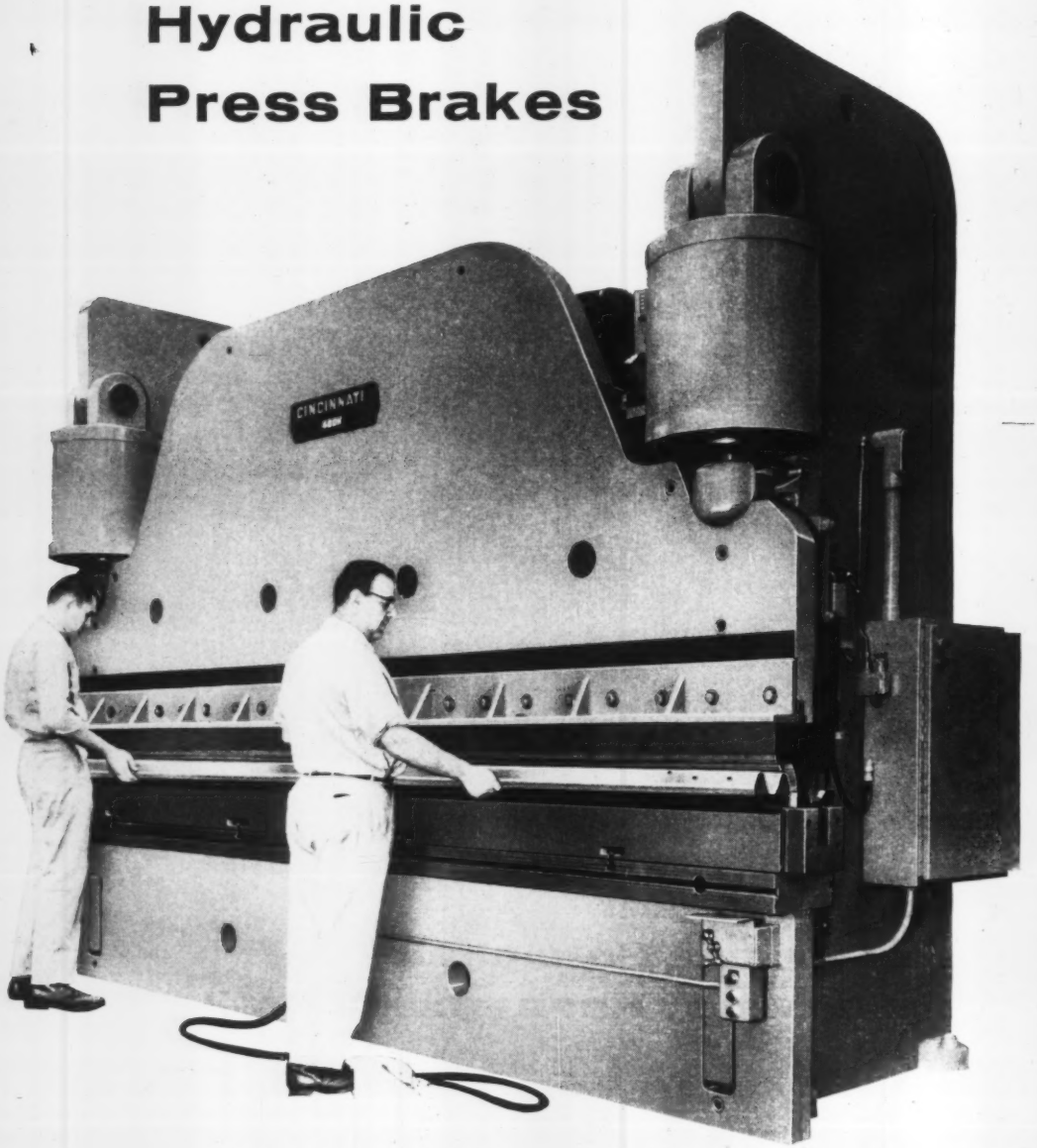
If you want this kind of reliable operation, call your nearest Research-Cottrell representative. He will be glad to discuss your requirements.

Research-Cottrell, Inc.

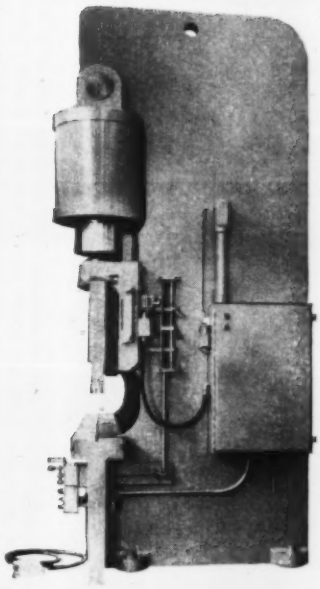
Main Office and Plant: Bound Brook, New Jersey

RC 201 District Offices and Representatives in principal cities of U. S. and Canada

3 basic advantages of CINCINNATI® Hydraulic Press Brakes

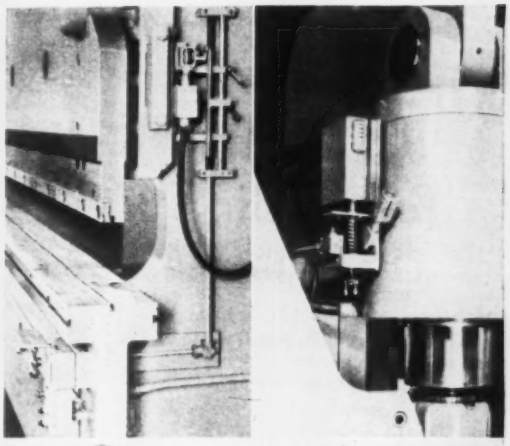


Cincinnati® Hydraulic Press Brakes, now available in 300, 400, 500, and 600 ton capacities, are not substitutes for Cincinnati® Mechanical Press Brakes. Where high production, maximum accuracy, and greatly increased tonnage at the bottom of the stroke are required, Cincinnati Mechanical Press Brakes remain unchallenged. However, where accuracy requirements are not extremely critical, where high speed is not necessary and where long strokes are desirable, Cincinnati Hydraulic Press Brakes offer important advantages—some entirely new to the field of hydraulic press brakes.



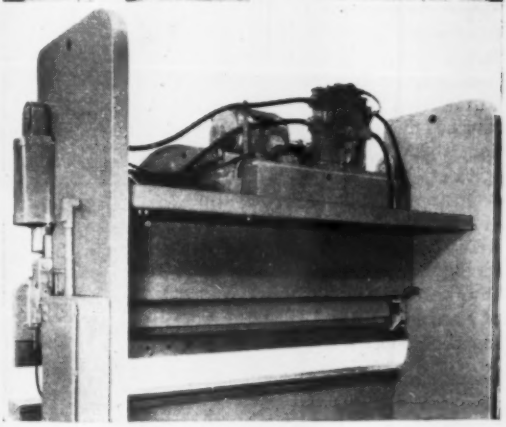
1 Accuracy

A special Cincinnati feature is extra heavy housings which extend above the cylinders, providing a means for their unique clevis mounting. This gives true center-line loading: vertical thrust of the cylinders is carried by the housings *without welds or bolts*. The cylinders are connected to the ram with ball joints and are self-aligning in all directions. Binding of pistons and ram slides cannot occur. In addition, deep beds and rams, and large radii at all stress points minimize deflection and insure maximum accuracy. With Cincinnati interlocked construction, the bed is supported directly by the housings *without* load bearing welds.



2 Convenience

All controls are at right end of the machine, within easy reach of the operator. The bottom stroke-stop adjusting crank is on the front of the bed. Micrometer registers are provided to indicate both the bottom stroke-stop and ram tilt adjustments, a great convenience in setting dies on initial or repeat setups. Tonnage, stroke length, and ram position are easily set. Indicator lights tell direction ram is moving or ready to move. Machine cannot overload: it reverses when loaded to any given tonnage setting.



3 Economy

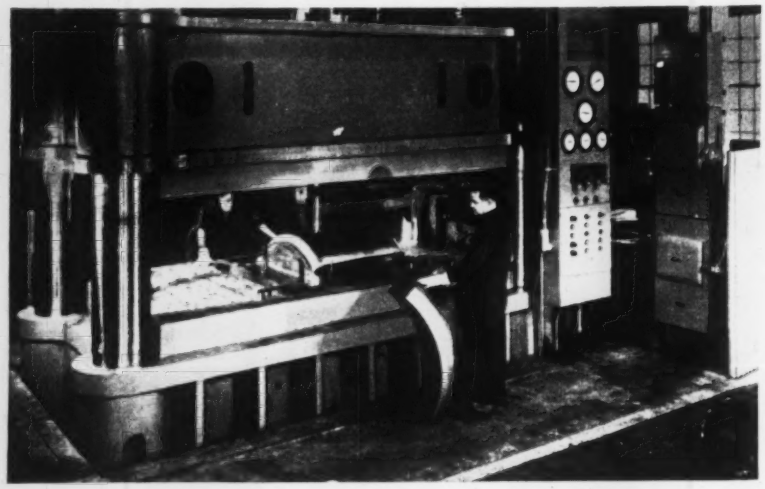
Greatly simplified maintenance and reduced cost result from Cincinnati's exclusive hydraulic manifold block, which brings valves and piping together in one compact assembly. The usual maze of valves, pipes and fittings is eliminated. High pressure joints are reduced to a minimum, which means important maintenance economies, year after year.

Write Dept. C for informative Bulletin HB-1.

Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO. Cincinnati 11, Ohio, U.S.A.

Lubrication



PREMIUM HYDRAULIC OILS CAN MORE THAN PAY BACK THEIR INITIAL EXTRA COST

Laboratory experiments, exhaustive field tests and, finally, general industrial experience have conclusively proved the long-term economy of a premium hydraulic oil over even the best straight mineral oil.

What makes a premium oil different? Straight mineral oil is a highly refined product containing many good lubricating qualities. However, it may be subject to fairly rapid oxidation, and it foams persistently when agitated.

On the other hand, a premium hydraulic oil, like Texaco Regal Oil R&O, contains a number of additives specifically designed to minimize or eliminate the undesirable qualities of straight mineral oil, while retaining the good.

Importance of these qualities in a hydraulic system. Oxidation, rust and foam all breed trouble in hydraulic sytems, even though they may not be immediately apparent. Because Regal Oil R&O is specifically inhibited to guard against these dangers, you can expect four distinct areas of savings, in spite of higher initial cost, when you install this premium oil in your hydraulic equipment:

It saves man-hours. Because a premimum hydraulic oil is inhibited against oxidation and rust, it will not form sludge in the system or allow parts to corrode. This can more than double the intervals between scheduled overhauls, saving valuable maintenance man-hours.

It prevents production losses. By keeping hydraulic systems clean, Regal Oil R&O guards against those sudden, unexpected stoppages that halt production, are costly to overcome. Pumps and other parts last much longer, too.

It cuts rejects when used in production equipment. Regal Oil R&O is inhibited against foaming. And foam, which causes jerky operation, can be a large factor in ruined machine parts.

It reduces oil drains. Because Regal Oil R&O lasts longer than straight mineral oil, systems don't have to be refilled nearly so often. The savings on this one factor alone are often enough to counterbalance the higher initial cost of Regal Oil R&O.

Way found to coat steel concrete forms without wasting oil

How to coat steel concrete forms without wasting a large amount of the oil in run-off has always been a problem for manufacturers of concrete products.

One of the country's leading concrete pipe producers has now licked this problem by using a 50-50 mixture of diesel fuel and Texaco Stazon. Originally developed as a non drip product for textile mills, this unique Texaco lubricant clings just as well to steel forms. The pipe manufacturer reports that run-off has now been eliminated completely. The new mixture can be used in temperatures as low as 0°F and can be either sprayed or painted on the forms.

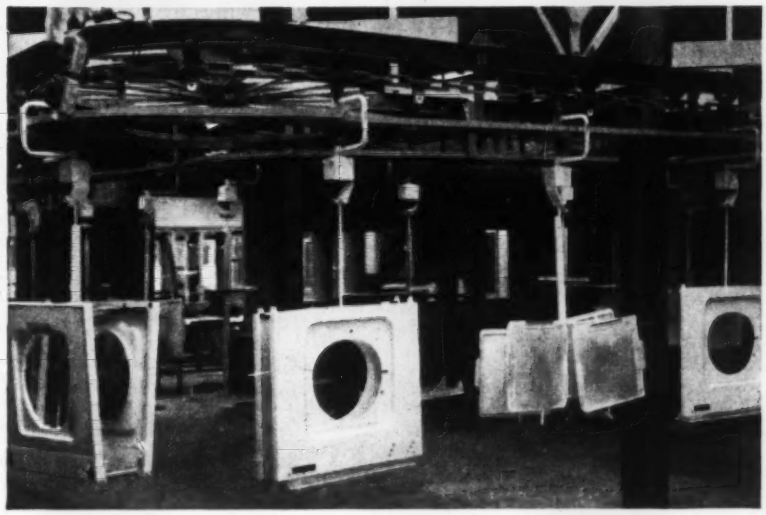
MOVIE OF THE MONTH

SEE...

"Shear Magic"

Texaco's new full-color film on the nature and uses of grease is a must-see feature for anyone interested in getting the most out of grease-lubricated equipment.

news



How manufacturer eliminated rejects caused by flaking conveyor

Flakes of rust dropping from the plant-wide conveyor system onto newly painted finishes were causing an unhealthy 10% reject rate for one manufacturer of large household appliances. His problem: the conveyor traveled through areas where the humidity was high, as well as through baking ovens. These widely varying heat and moisture conditions were too much for the conveyor finish.

Texaco called in. Although the problem was not directly associated with lubrication, the visiting Texaco Lubrication Engineer heard about it and recommended having the conveyor sprayed with Texaco Rustproof Compound L. This versatile Texaco product withstood both the excessive humidity and the high temperatures that the conveyor encountered in its travels around the plant. Rusting ceased and rejects of the finished product dropped drastically from 10% to a normal 1½%.

New Seagram building gets cutting oil bath

In one of the most unusual uses for a petroleum product yet, the Seagram building, on New York's Park Avenue, recently employed Texaco Sultex Cutting Oil as a bath for its unique bronze facade. The reason: a dark "antique" surface on the metal was wanted, and the sulphur in Sultex reacted nicely with the bronze to give the desired effect of age!

NEW PRODUCT NEWS

New tool joint compound resists pressure used in joining pipes, and joints can be broken without using much more torque than was applied in making them up. Primarily for use in oil fields. Makes an excellent thread lubricant anywhere where cost is a big consideration.

Lube facts to be aired for metal-working plants

The story of many of the less common, "odds and ends" lubricants used in metalworking will be told in the July issue of "Lubrication" magazine. The editors plan to discuss roll oils (both ferrous and non-ferrous), lubricants for hot punching, deep press drawing, wire drawing and the like. To be sure you're on the list to get this important issue, mail coupon.

Clip Coupon To Company Letterhead

TEXACO INC., Dept. S-LN-20
135 East 42nd Street
New York 17, N. Y.

Dear Sirs:

☐ I am interested in seeing "Shear Magic".

I would like a free copy of

☐ Lubrication Magazine

☐ Management Practices that Control Costs via Organized Lubrication.

Name_____ Title_____

Firm_____

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To get highest possible quality

Lewis Walker, president of Talon, Inc., left, discusses Shu-Lok with David Rae, general manager of the Shu-Lok Fastener Division.

. Talon, Inc. starts with

Quality Steel

"We must have the best steel"—says Carl M. Joslyn, plant manager of Shu-Lok Fastener Division, shown above with David Dibbell, Shu-Lok sales manager.

Sharon supplies prime stainless for Talon's remarkable Shu-Lok

"The greatest thing that's happened to shoes since we killed the high button", say shoemakers. "A godsend"—agree mothers of little boys everywhere. Businessmen and athletes, too, are outspoken when describing the remarkable new Shu-Lok developed by Talon, Inc.

The Shu-Lok is an ingenious metal slide that "laces" shoes to the wearer's desired tightness instantly by simply pressing a small lever to the instep. Like all Talon creations the Shu-Lok is a highly perfected top quality product designed and built to provide years of service.

To make doubly sure it would do the job, Talon's engineering and production people decided to fabricate Shu-Lok of stainless steel. To make certain of the finest stainless, they came to a leading stainless producer, *Sharon Steel Corporation, Sharon, Pa.*

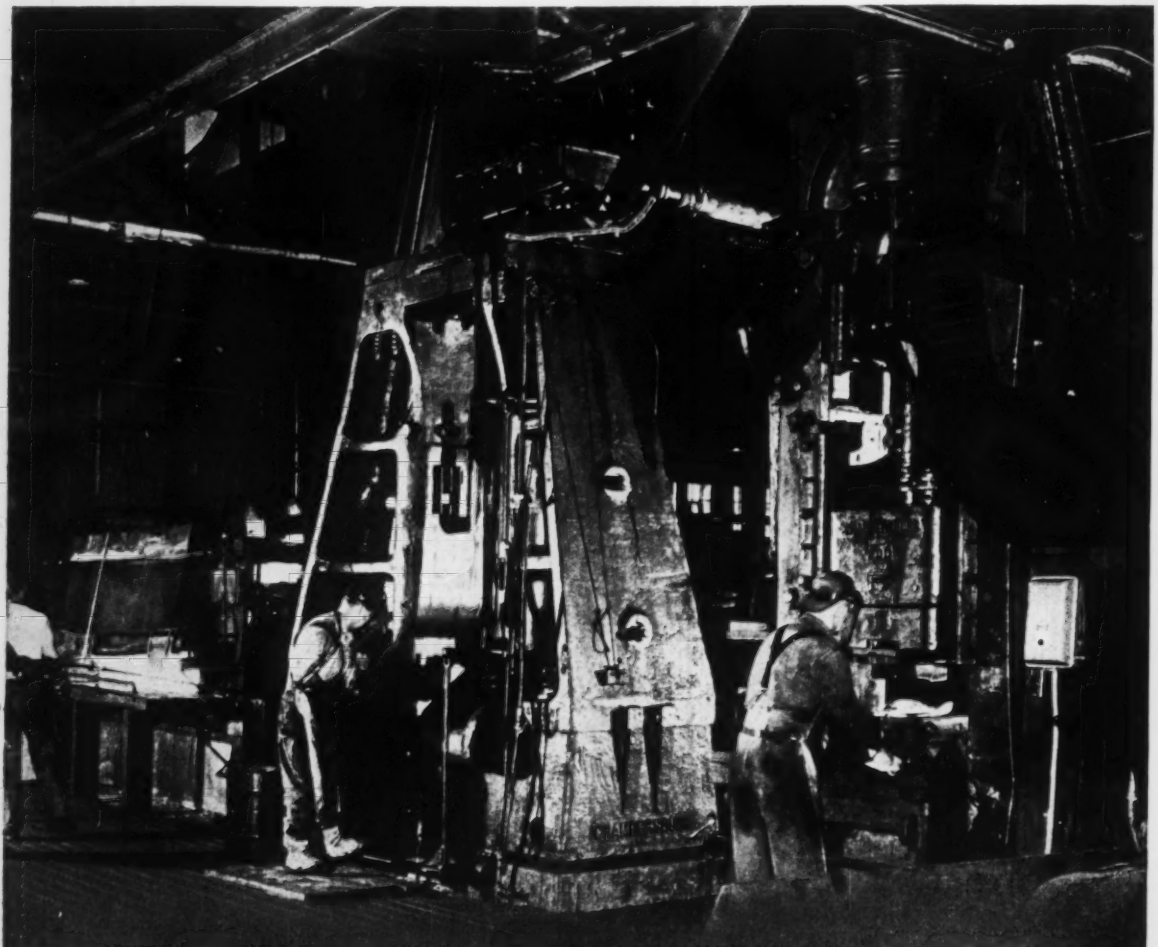
PHOTOS BY KARSH OF OTTAWA

"Supplier reliability is important"—F. V. Hanaway, manager of purchases, Talon, Inc. Here Mr. Hanaway, center, talks steel with Sharon salesman Gordon Garrett and Talon steel buyer Carl Parson.

"Steel quality dictates design"—Thane E. Hawkins, chief engineer, Shu-Lok Fastener Division.

SHARON *Quality* **STEEL**

SHARONSTEEL



Production Increased 30%

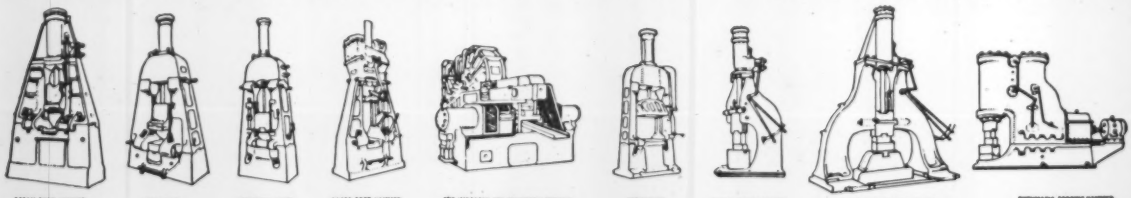
Shown here is a 6000 lb. Chambersburg Steam Drop Hammer and a No. 200 Chambersburg Steel Side Trimming Press installed in a forge shop specializing in railroad car parts, gear blanks and general job forging. A 2000 lb. hammer and a No. 100 Trimmer are also installed. Hammers operate on air.

In replacing older hammers, the Chambersburgs were selected for the accuracy and quality of their manufacture. Experience to date shows maintenance costs are lowered, rejects are fewer, less down time is required, and as a result management figures production is up 30%!

If you are interested in getting similar results in your own shop, write for a copy of Bulletin 55-L-4.

CHAMBERSBURG • The Hammer Builders

CHAMBERSBURG ENGINEERING COMPANY . . . . . CHAMBERSBURG, PENNSYLVANIA



Nickel-Coated THOMAS STRIP Cuts Aladdin's Metal Costs 56%

Aladdin had his fabled magic lamp.

But in real life, Aladdin Manufacturing Company uses nickel-coated Thomas Strip steel to work production magic in its Minneapolis, Minn., plant.

From copper to aluminum to slit steel sheets to plain strip and finally—to cold-rolled strip steel pre-coated with nickel by Thomas Strip Division of Pittsburgh Steel Company.

That's the route followed by Aladdin's Merrill B. (Ted) Wilcox in his five-year effort to find just the right metal for use in his company's line of handsome, useful Jon-E Hand Warmers.

Thomas Strip Division has grown into Aladdin's major supplier of nickel-coated strip because:

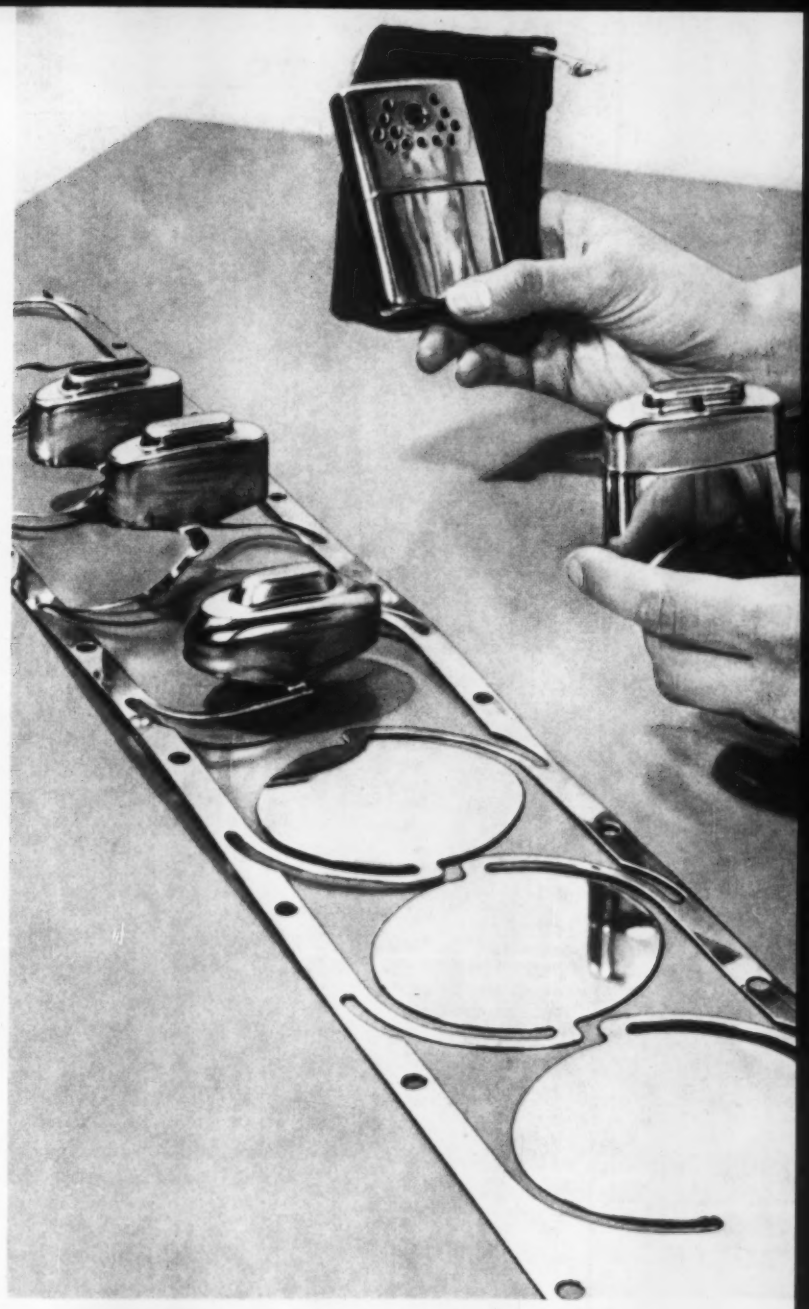
1. **Pre-coated nickel strip cut Aladdin's cost per pound of metal used from 50 cents for plain strip steel to 22 cents.**

2. **Use of nickel-coated strip enabled Aladdin to consolidate four separate production steps—each costing a cent—into a single step.**

3. **Pre-coated nickel cut scrap losses from a high of 20% (with slit sheets) to less than 1%.**

4. **Electrolytic coatings of nickel are more uniform, assuring the necessary snug fit of all Jon-E's components. And the only finishing Aladdin needs on nickel-coated strip is a quick ball-burnishing.**

All the production and design advantages of Thomas Strip are available to you. It is sold plain or electrolytically coated with copper, brass, nickel, chrome or zinc. Thomas also sells a full line of lacquered products. Call the nearest district sales office listed here. Do it today.



SIX-STAGE PROGRESSIVE die forms one Jon-E fuel chamber with every stroke of the press at Aladdin Manufacturing Company. This imposes severe demands on drawability of the 4½-inch nickel-coated steel strip supplied by Thomas Strip Division, Pittsburgh Steel Company. Aladdin credits Thomas Strip with 56% savings in metal costs, as well as sharply reduced scrap loss.

Thomas Strip® Division

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio

TAKE THIS SHIRT-SLEEVE SHORT-CUT TO MORE EFFICIENT ASSEMBLY!

Are you open-minded about methods of permanent fastening? If so, it will pay you to call in your nearby Thomson Fastening Man. Ask him to look at your new-product sketches or old-product assembly lines. Chances are, he can tell on the spot whether you can speed production or cut costs with time-tested automatic positioning and fastening techniques. If not, he'll pass your problem, drawings or samples along to his home-office engineers who know when riveting beats stapling, welding, cementing and other permanent fastening methods.

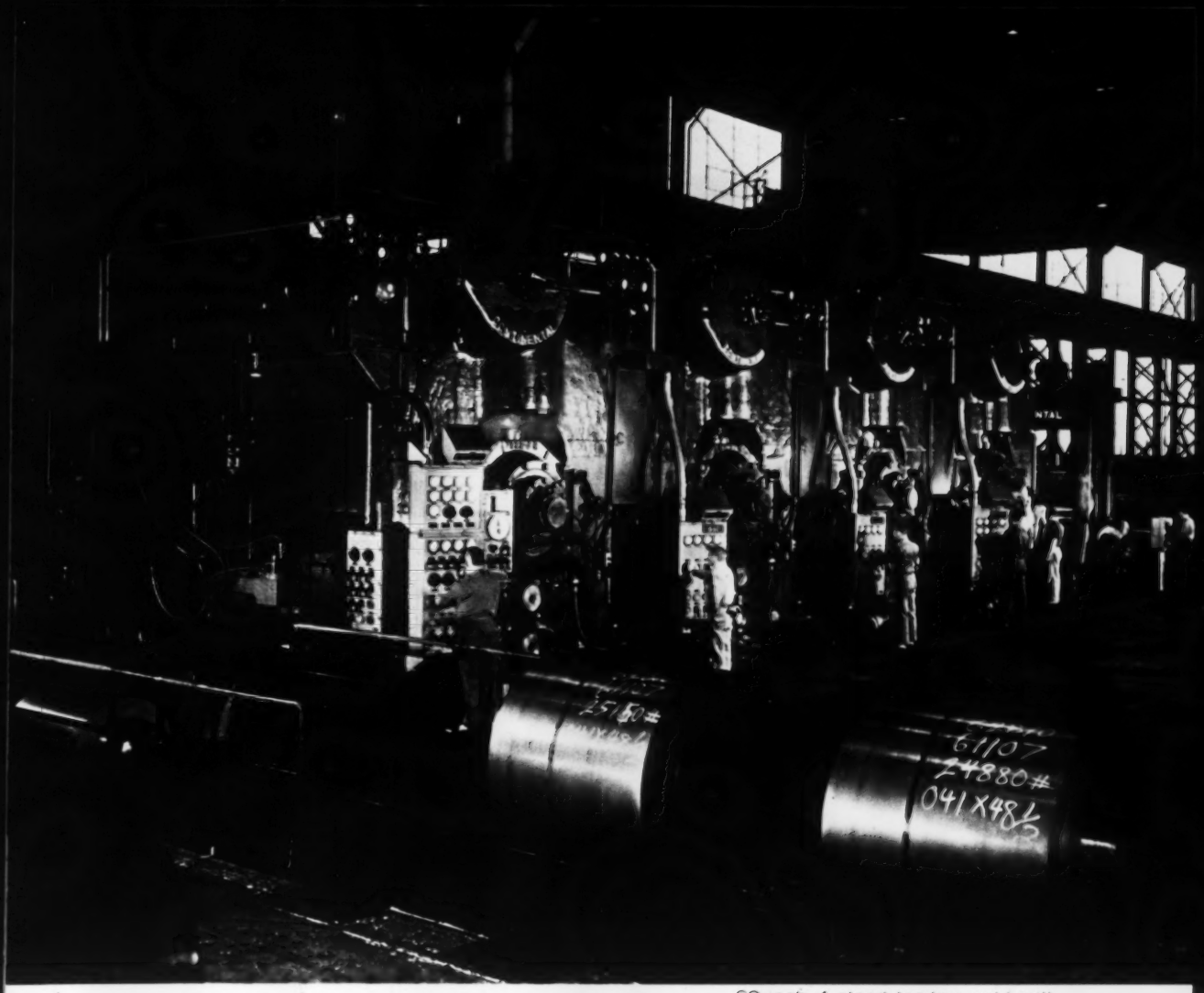
Your Thomson Fastening Man sells by giving shirt-sleeve service. He's more interested in solving fastening problems than in selling rivets. So, use him freely as your direct contact with 74 years of fastening experience. Why not make a date with him soon? Write today to Dept. S.

JTL

JUDSON L.

THOMSON

MFG. CO., WALTHAM 54, MASS.



60-inch, 4-stand tandem cold mill

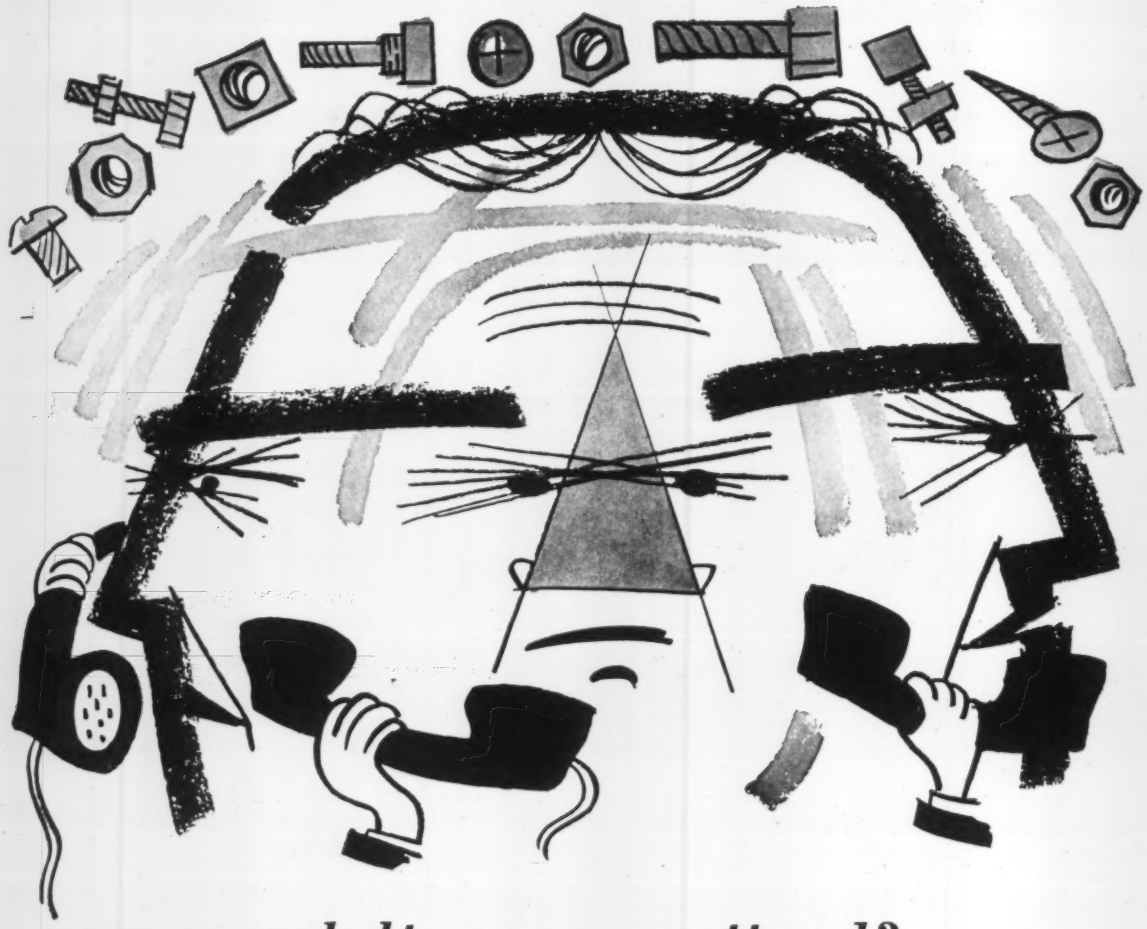
BLAW-KNOX COLD STRIP MILLS

Blaw-Knox designs and builds all types of cold reduction and temper mills for ferrous and non-ferrous work. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations including all auxiliary equipment for ferrous and non-ferrous metals, iron, alloy iron and steel rolls, Medart cold finishing equipment, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat and corrosion resisting alloy castings.

BLAW-KNOX

BLAW-KNOX COMPANY

Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania



are your bolt sources scattered?

Buying bolts from scattered sources can waste a lot of time. Slow down production. Cause all kinds of headaches and delays.

There's a better way: Get all your bolts from Sheffield. You'll have a *single source* for a *full line*. Thousands of standard and special bolts. Or bolts made to your specifications in record time.

You get quick shipment because Sheffield has one of the world's largest integrated bolt plants. You get the advice and technical help of bolt specialists. And with every bolt you get quality that's rigidly controlled from furnace to finished product.

Anyway you look at it, you're ahead when you make Sheffield your single source for every bolt need. Call your Sheffield Man for all the facts.

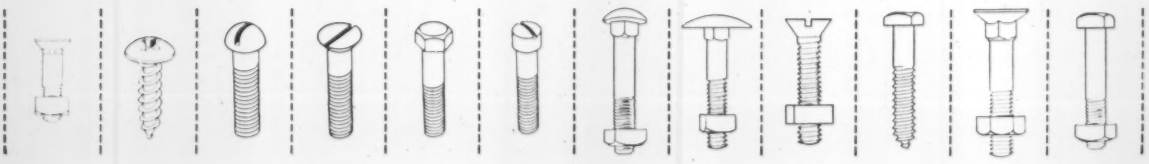
Bolt Makers Since 1888

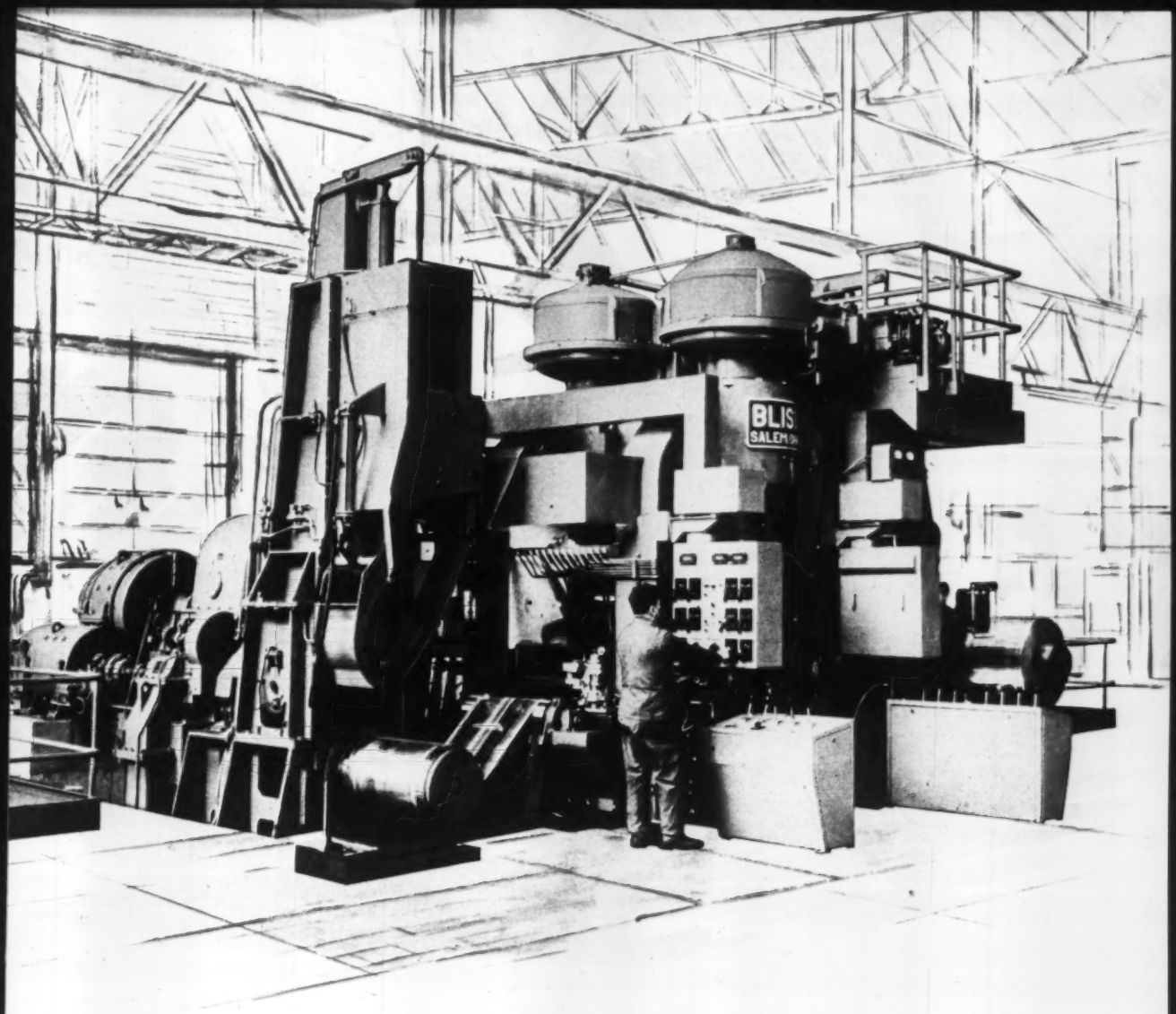
SHEFFIELD DIVISION

ARMCO®

ARMCO STEEL CORPORATION

OTHER DIVISIONS AND SUBSIDIARIES: Armco Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products





New Bliss reversing cold mill for France's largest producer of brass strip

Near Paris, Compagnie Française des Métaux, France's largest producer of brass strip, rolls brass on its new Bliss 6½" & 30" x 36" four-high reversing cold mill.

The mill, which can attain a speed of 1,000 fpm is equipped with the auxiliaries necessary to produce brass strip of the highest quality, in widths up to 30" and thicknesses as fine as .0028".

The brass thus produced is used throughout French industry...for automobiles...for defense...for hard goods...for jewelry...for the myriad needs of free Europe.

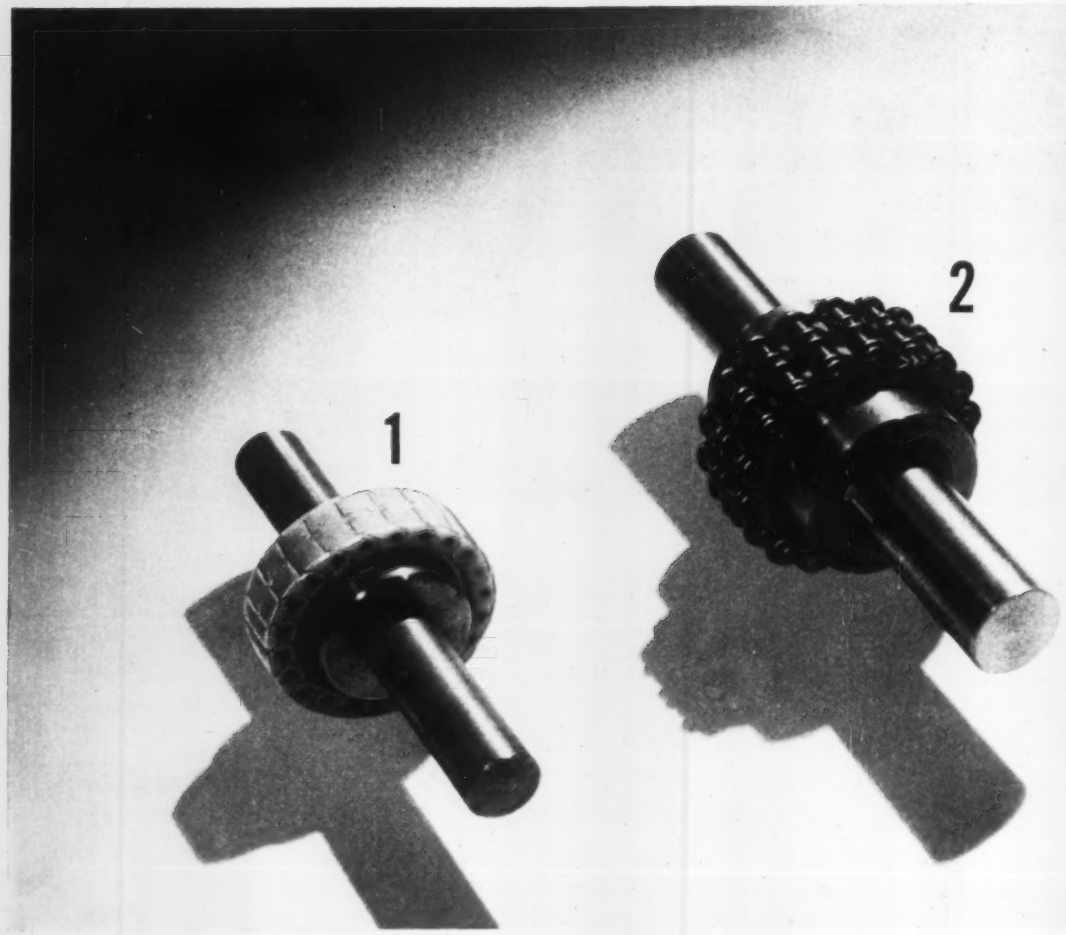
The Paris installation of Compagnie Française des Métaux is the latest of many such Bliss mills being operated throughout the world, rolling all kinds of ferrous and non-ferrous material. To learn of other Bliss-engineered installations, write for a copy of our 84-page Rolling Mill Brochure, Catalog 40-B.

BLISS
SINCE 1857

Bliss is more than a name . . . it's a guarantee

E. W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio



Morse's new Nylon Coupling means:

Nobody can answer your coupling because only Morse offers

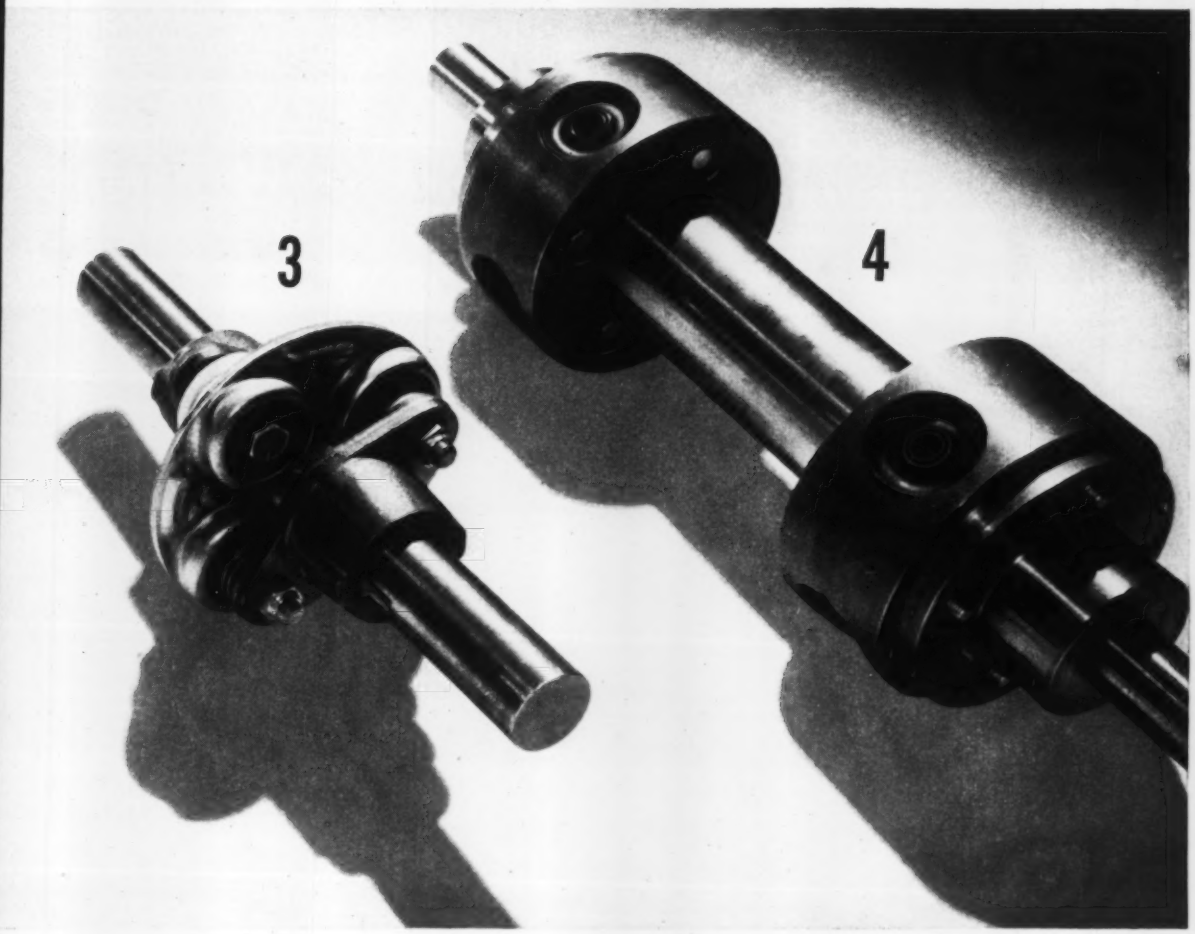
1 New Nylon Couplings:
Cost 20% less than conventional couplings; last indefinitely. Need no lubrication, no cover; take high torque; adjust to misalignment.

2 Flexible Chain Couplings:
For moderate speeds, steady loads. Rugged, economical . . . take higher h.p. per given diameter. Easy to install, align, and disassemble.

3 Morflex Couplings:
Preloaded neoprene biscuit assembly reduces misalignment stresses, increases bearing life; protects machine from shock and vibration.

4 Radial Couplings:
Neoprene biscuits—assembled radially on pins—take heavy thrusts, torques, shocks, frequent load reversals; retain torsional flexibility.

NOTE: All Morse couplings are available in driveshaft constructions.



problems as well as Morse, all four of these flexible couplings

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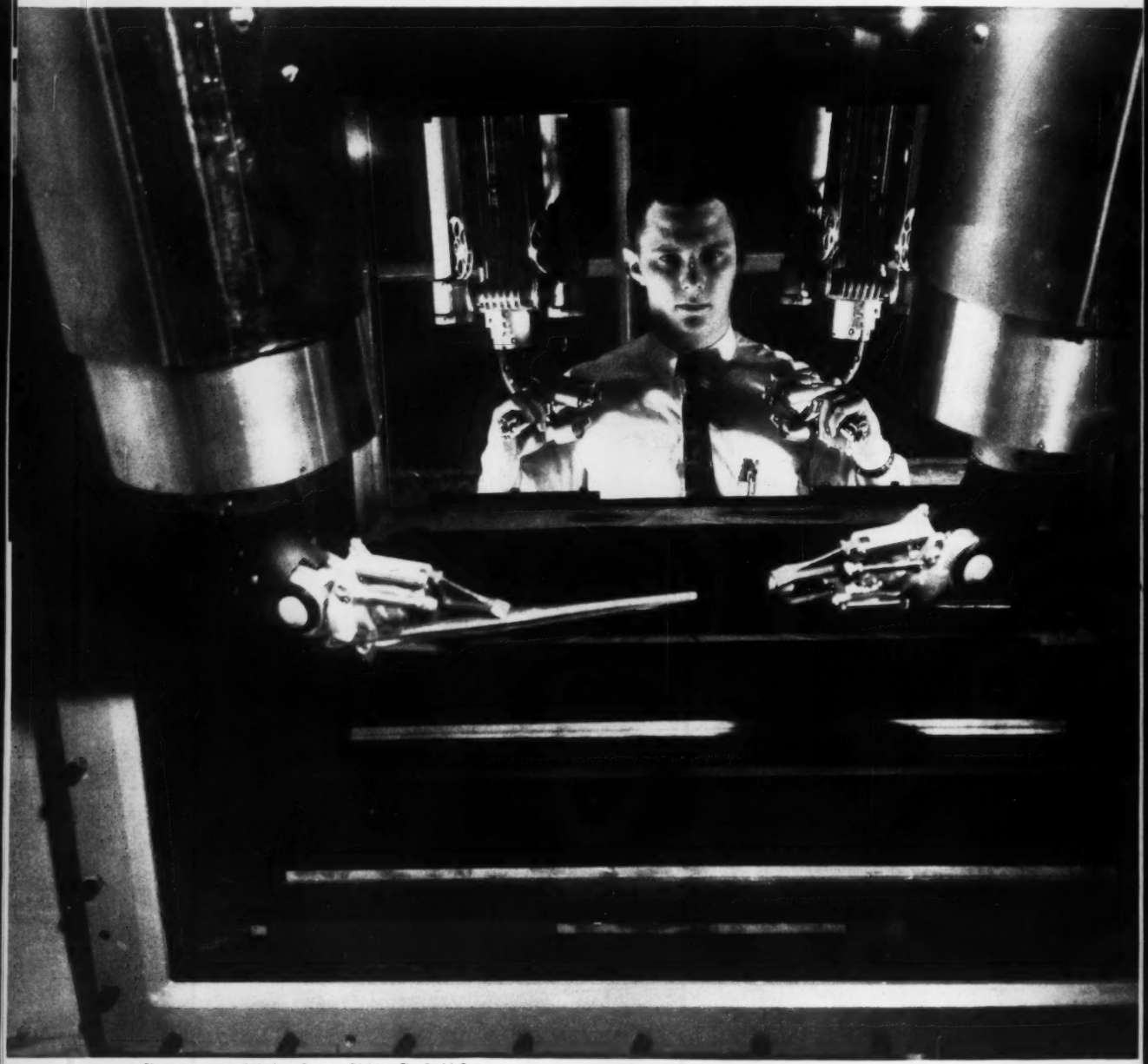
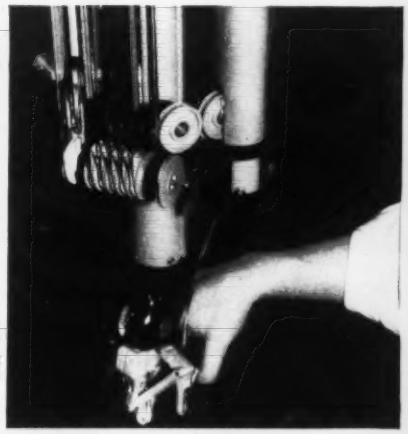
How NS solved another special steel problem



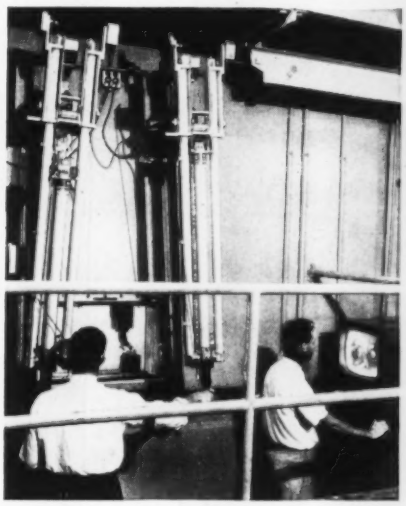
Photos courtesy of Nuclear Systems Division, The Budd Company

RADIOACTIVE MATERIAL is handled remotely by operator from behind three-foot thick lead-glass wall. Nilcor strips, which make quick, accurate system response possible, can be seen running vertically from pulleys just above operator's hands.

SPECIAL NS-ATHENIA STEEL PUTS LIFE IN ATOMIC-AGE ROBOT



HAND MOVEMENTS at operator end of master-slave system are translated without distortion, or time lag through seven Nilcor strips (shown in photo) that travel through 15-foot belt and pulley system.



OPERATOR STATION, shielded by protective wall, has television monitor screen where action inside radioactive room is reproduced as operator manipulates controls of master-slave system.

To manipulate radioactive materials with lifelike dexterity, from the other side of a three-foot thick protective wall, requires robot controls with a high degree of precision and quick response.

Ordinary cable or belt arrangements gave too much stretch between the operator's "master" hand movements and the identical "slave" movement at the other end of the system. Movements had to be translated almost instantaneously and duplicated exactly at the slave end of the system. To help solve this problem, robot system manufacturers came to the Athenia Steel Division of National-Standard to find a strip material that would serve in the belt-and-pulley arrangement of the mechanism with minimum stretch and friction and without backlashing or overshooting.

NATIONAL-STANDARD ENGINEERS at Athenia in Clifton, N. J., recommended Nilcor* strip (basically a cobalt-chromium-nickel alloy) because of its high fatigue resistance, high tensile strength and exceptionally high corrosion resistance—plus less than ⅛-inch lateral sweep per 8-foot length when laying flat without tension. Experiments with .005 Nilcor strip in the robot systems showed an 80% reduction in stretch and 90% reduction in friction over standard wire materials.

EXPERIENCED ENGINEERING HELP of this kind, for jobs requiring specialty steel and wire to meet unique applications, is available to *you* from National-Standard. For the many thousands of applications where only specialty steel or wire will solve the problem, let National-Standard engineers go to work for you. Write for additional information to National-Standard Company, Niles, Michigan.

*Trade Mark

Manufacturer of Specialty Wire and Metal Products

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DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; tire wire, stainless, music spring and plated wires • **WORCESTER WIRE WORKS** Worcester, Mass.; high and low carbon specialty wires • **WAGNER LITHO MACHINERY**, Secaucus, N. J.; metal decorating equipment • **ATHENIA STEEL**, Clifton, N. J.; flat, high-carbon spring steels • **REYNOLDS WIRE**, Dixon, Ill.; industrial wire cloth • **CROSS PERFORATED METALS**, Carbondale, Pa.; decorative, commercial, and industrial perforated metals.

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Rollers are crowned to prevent end-loading and the resultant spalling of races. Directional trueness is maintained by retainers of standard bronze or "Rollube" ferrous alloy of one piece or two piece construction.

You may wish to refer to the Rollway Catalog and Engineering Data Book when writing specifications for a high precision bearing. It contains the first listing, by any manufacturer, of the thrust capacities of cylindrical radial roller bearings. Send for it today.

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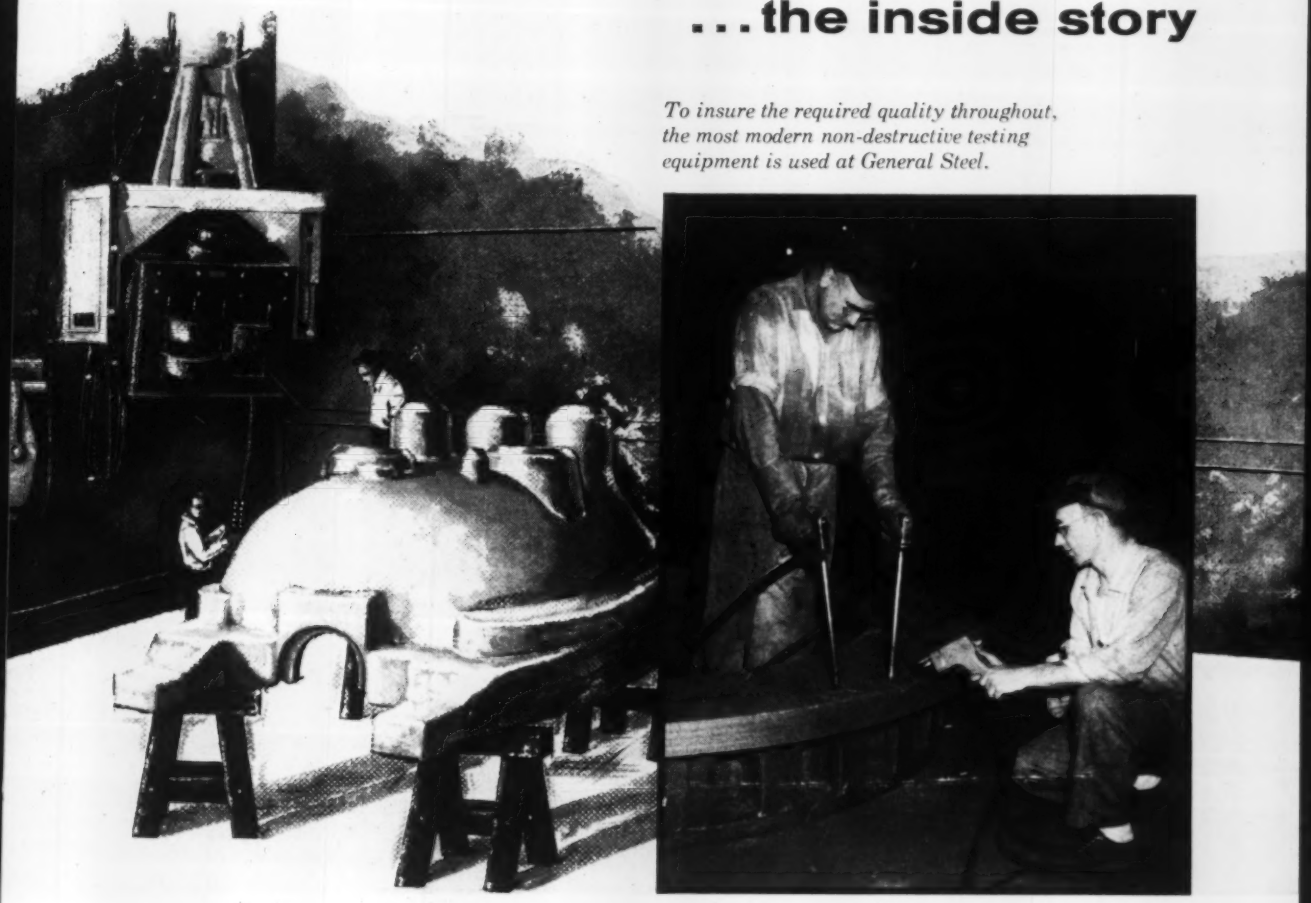
NON-DESTRUCTIVE TESTING ...the inside story



To insure the required quality throughout, the most modern non-destructive testing equipment is used at General Steel.

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Among the facilities available at General Steel are magnetic particle inspection units to check for invisible surface defects, and ultrasonic reflectoscope units for sonic testing of internal metal. Radiographic inspection of very heavy structures is done with 24-million volt Betatron units. Conventional X-ray equipment is used for smaller structures. Other methods of non-destructive testing are also available.

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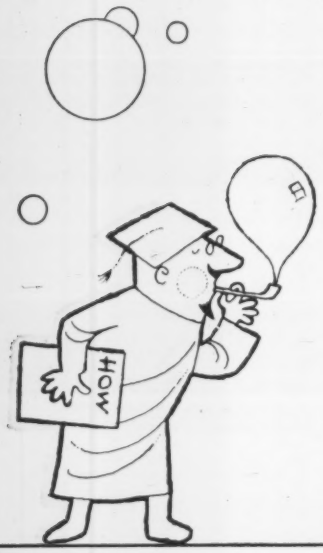

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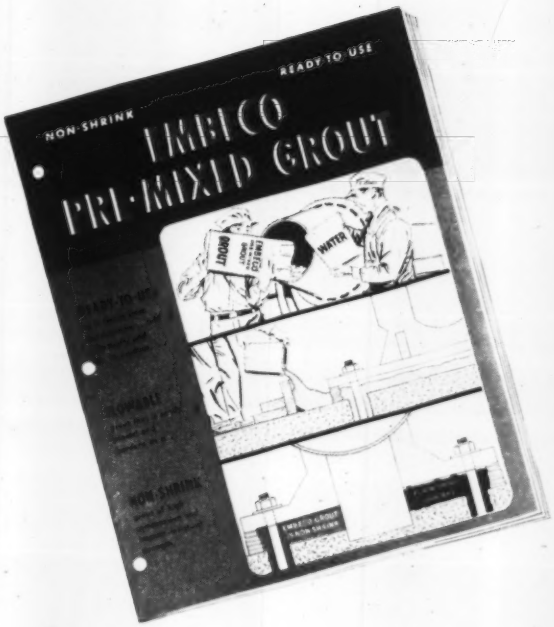

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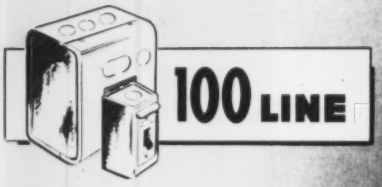
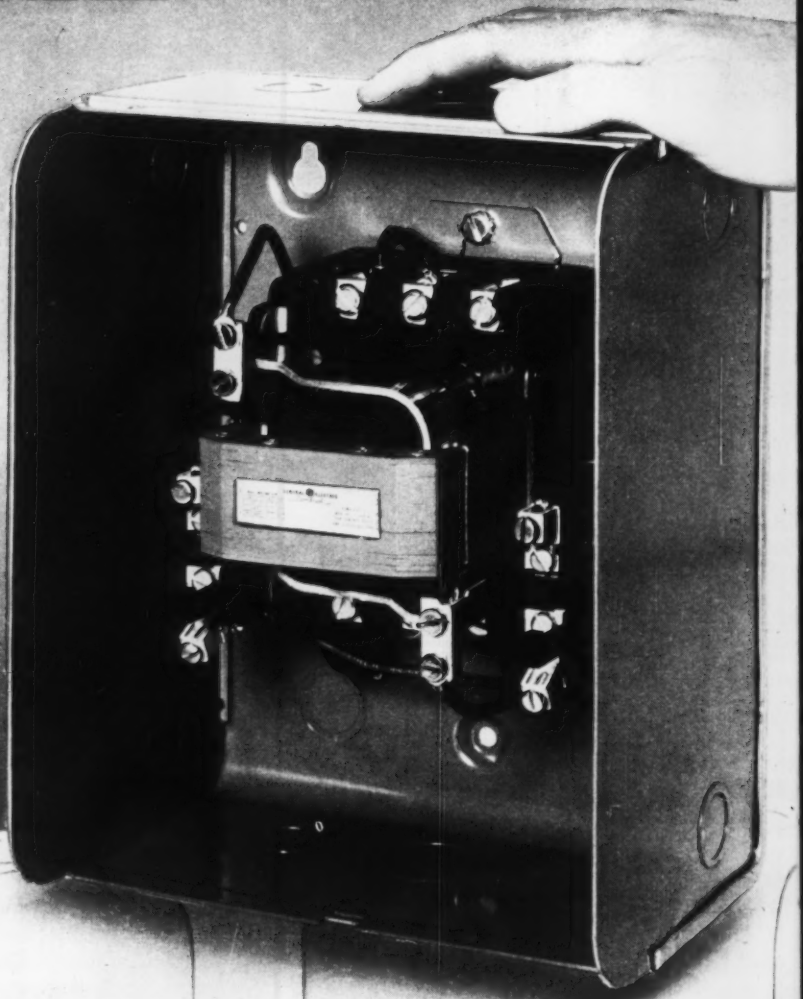
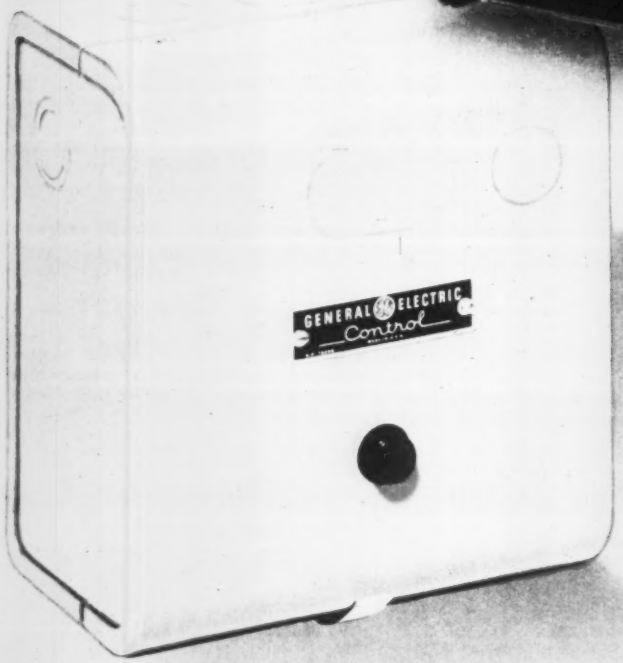
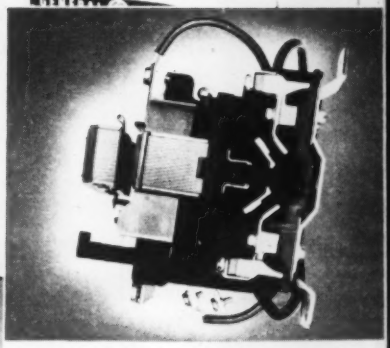
NOW AVAILABLE IN GENERAL ELECTRIC'S



100 LINE







WEDGE-ACTION DESIGN (see cross-section cutaway) gives positive "make." A quick, clean "break" is assured by spring-loaded contacts and a low-stress "kick-off" spring.

FIELD-PROVED 100-LINE DESIGN . . .

NEW SIZE 2 MAGNETIC STARTER

General Electric now offers a Size 2 magnetic starter that is 34% smaller than previous open forms, and includes all the field-proved features of General Electric's 100-Line. You get better performance, less maintenance and greater dependability because:

WEDGE-ACTION CONTACTS provide more positive "make". Reduced armature mass and spring-loaded contacts practically eliminate bounce. Contact springs and a special "kick-off" spring provide positive "break". Vertical contacts shrug off dirt and dust.

NEW ARC TRAP DESIGN actually attracts arcs away from contacts and dissipates them harmlessly to prolong contact life.

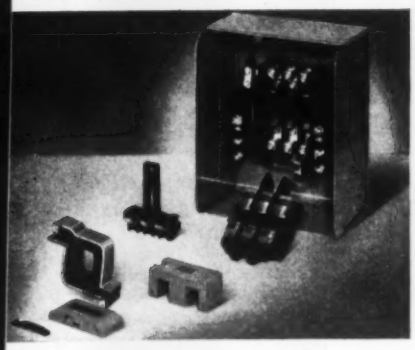
SNAP-SLIDE CONSTRUCTION makes possible complete disassembly of the starter in 20 seconds. Contacts can be removed and inspected in ten seconds.

STRAIGHT-THROUGH WIRING means no wires need be bent or looped, and all wiring is done from the front. Pressure-type terminals and 10% more wiring room speed installation.

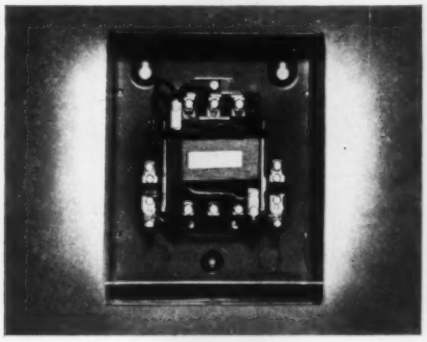
For more information, contact your nearest General Electric Apparatus Sales Office or Distributor, or write Section 733-45, General Electric Co., Schenectady, N. Y. (Ask for Bulletin GEA-6917.)

RUGGED DEPENDABILITY of new General Electric Size 2 starter is proved by severe plugging-duty torture test.

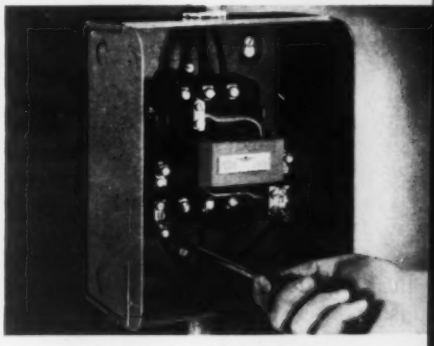
GENERAL ELECTRIC



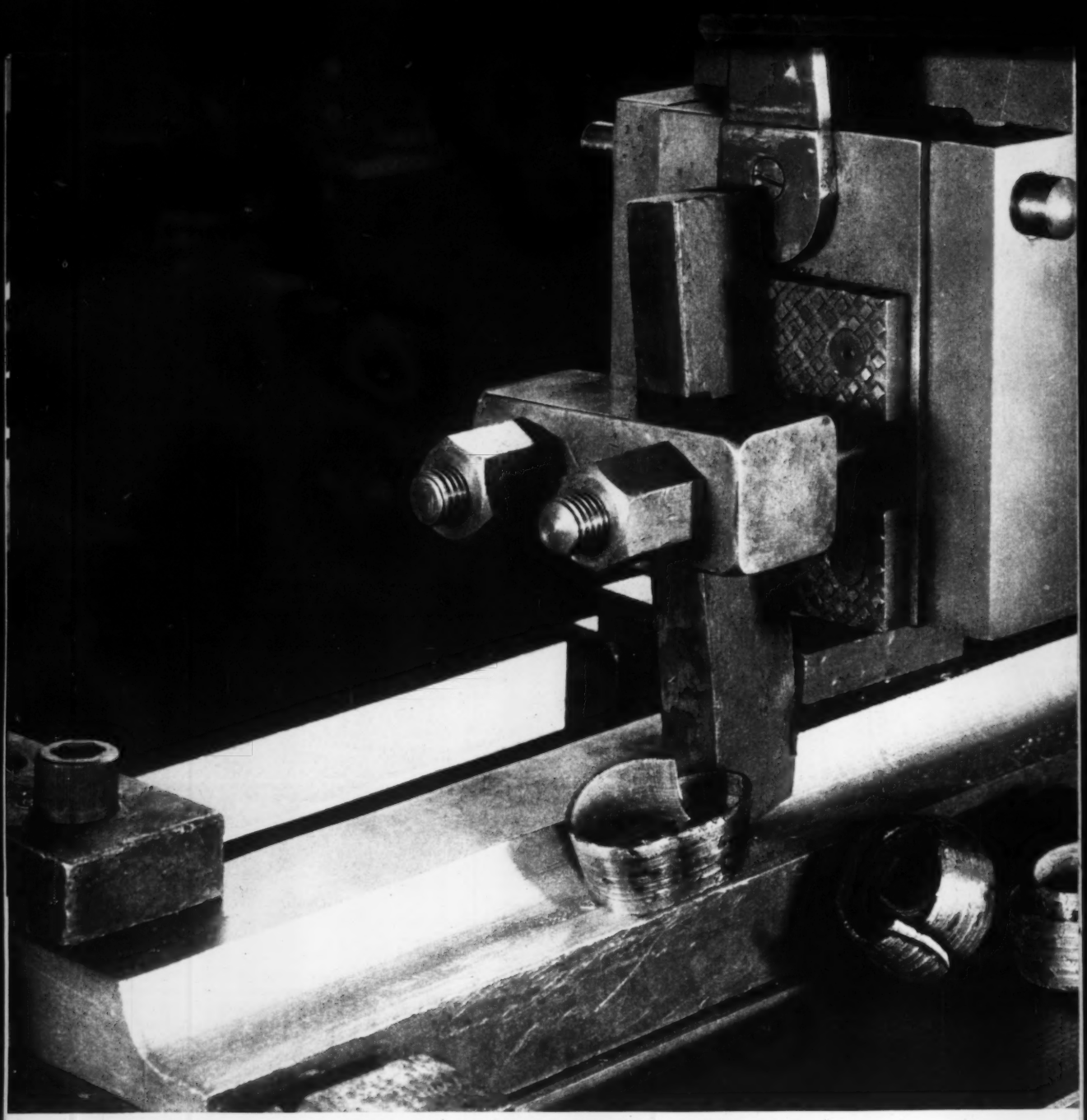
SNAP-SLIDE CONSTRUCTION permits complete starter disassembly in 20 seconds without tools. All operating parts either snap or slide together for maximum accessibility.



10% MORE WIRING ROOM makes the new Size 2 starter easier to wire, even though it is 14% smaller than previous enclosed forms. Wrap-around cover adds extra accessibility.



STRAIGHT-THROUGH WIRING with line terminals on top and load terminals on bottom saves wiring time. All wiring is done from front, and no wires need be bent or looped.



Machining gib for heavy duty lathe from cold rolled steel. Depth of cut: ¾"; feed: .060"

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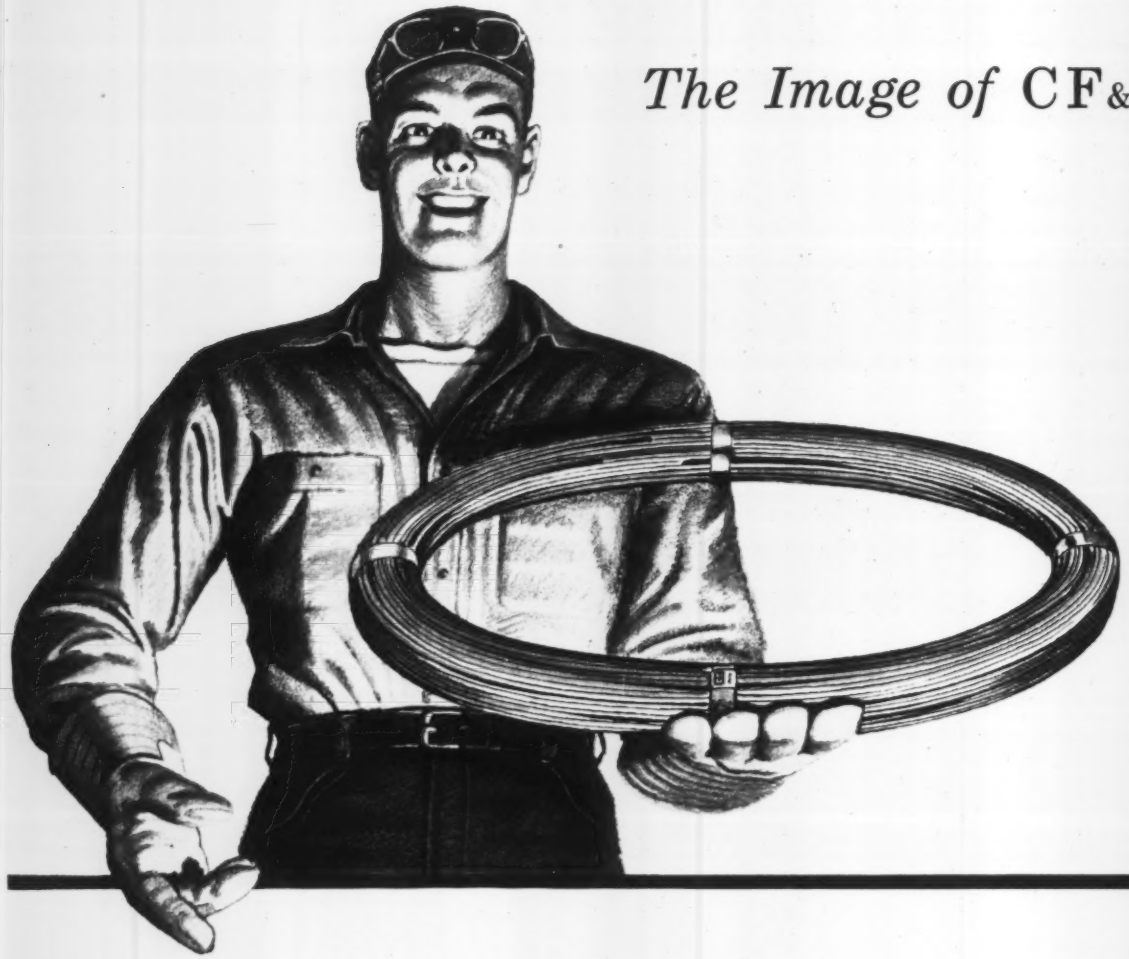
The Image of CF&I



THE CF&I GIANT stands for "steelmanship"—the science of developing new and improved steel products for all industries. An example of how CF&I's continual research benefits *wire users* is our new Black Satin finish on Round and Square Oil Tempered Wire.

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BLACK SATIN

a unique Oil Tempered wire finish to cut your production costs

These tags show:

Heat Number_____

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Tensile Strength_____

Date_____

Coil Number_____

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This color tag system also facilitates your job of inventory control, in-plant storage, and materials handling.

Besides Oil Tempered Wire, CF&I supplies all types of quality steel wire—and you can specify your wire *packaged for your production.* These different packages offer you various operating advantages from less machine downtime to easier unloading, storage, inventory control and continued cleanliness of the wire.

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JAMES A. REYNOLDS, *General Purchasing Agent,*
Manning, Maxwell, & Moore Inc.
Manufacturers of valves, gauges, industrial instruments, electronic process control systems, cranes, and hoists.

POSTSCRIPT: THE PRODUCTS OF THE FORGING INDUSTRY ARE FOUND AT VITAL POINTS OF MODERN CONVEYANCES AND MACHINES... LEVERS, STRUTS, CRANKSHAFTS, GEARS. THE FORGING PROCESS IS UNLIKE ANY OTHER. *FORGED* PARTS START WITH REFINED METALS – METALS ALREADY TRIED AND PROVED. THESE METALS ARE GIVEN ALMOST ANY DESIRED SHAPE BETWEEN IMPRESSION DIES, UNDER ENORMOUS PRESSURE OR BY CONSECUTIVE BLOWS FROM POWERFUL HAMMERS. THE PROCESS IMPARTS ADDED STRENGTH AND TOUGHNESS... WHICH PERMITS WEIGHT-SAVING DESIGNS, CUTS SERVICE COSTS, HELPS PROVIDE SAFETY IN A HIGH-SPEED WORLD.

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Cut your inventory and make your buying easier.

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No. 5 Electrolytic Tinning Line, Cary Sheet and Tin Mill, U. S. Steel Corporation

Wean, U. S. Steel and Tinning . . .

Twenty-two years ago the world's first commercial production electrolytic tinning line went into operation. Using the "Ferrostan" process, which was developed by U. S. Steel, the line was engineered by Wean and technical personnel of U. S. Steel.

The years of experience and constant progress since that initial installation are incorporated in this "Ferrostan" line. It features the most modern advances in automated tinning line design: cleaning and plating tanks are elevated to reduce basement complexity and simplify maintenance; both recoiling and shearing equipment are provided to satisfy all customer requirements; and an electronic data-logging system provides a "process profile" of all coiled tin plate.

Wean is justly proud of its many years of leadership in tinning line technology: 75% of all electrolytic tin plate produced is the result of Wean's *creative engineering*.

THE WEAN ENGINEERING COMPANY, INC. • WARREN • OHIO

This Sandusky Centrifugal Casting—one of four produced for Westinghouse Atomic Equipment Department—meets radiographic, intergranular corrosion, and all other rigorous chemical and physical tests.

SANDUSKY CASTING ...makes 4 giant stator shells

Specified by Westinghouse for 4 canned motor pumps soon to be integral parts of reactor system in Yankee Atomic Electric Plant in Rowe, Massachusetts

One king-size 17-ton Sandusky casting supplied the main motor bodies (stator shells) for the four pumps being built by Westinghouse, each to handle 23,600 g.p.m. of pressurized water through the reactor core.

The 25-foot-long Sandusky casting was centrifugally spun of a modified CF-8 (Type 304 L) stainless steel, then machined by Sandusky to a 3" wall thickness, 31½" on the O.D. This huge casting was hydrostatically tested to 3800 psi before being sectioned into four 68" lengths.

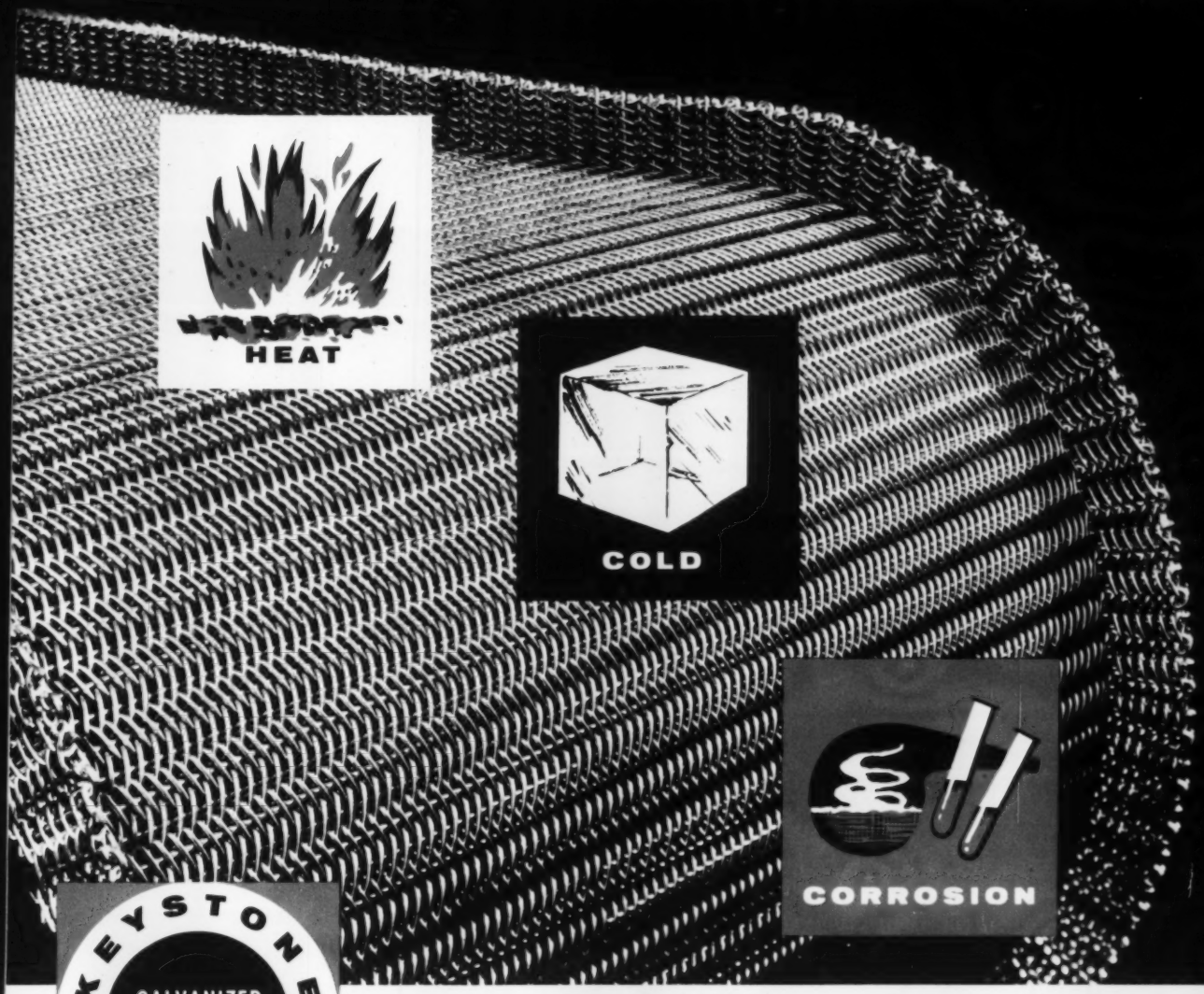
These stator shells represent another *new and exacting application* for Sandusky Centrifugal Castings—which may offer a practical and economical answer to *your* cylindrical requirements also. They are available in diameters from 7" to 54"—in lengths up to 33 feet—in heat- and corrosion-resistant stainless, carbon and low-alloy steels and a wide range of copper-base and nickel-base alloys.

Let us show you how Sandusky Centrifugal Castings can help solve your cylindrical problems. Write to us at Sandusky, Ohio.

SANDUSKY (S) CENTRIFUGAL CASTINGS

FOUNDRY & MACHINE CO.

SANDUSKY, OHIO Stainless, Carbon, Low-Alloy Steels—Full Range Copper-Base, Nickel-Base Alloys



KEYSTONE
GALVANIZED INDUSTRIAL WIRE
WIRE STUDY

ALLOY WIRE BELT COMPANY solves these problems with KEYSTONE WIRE

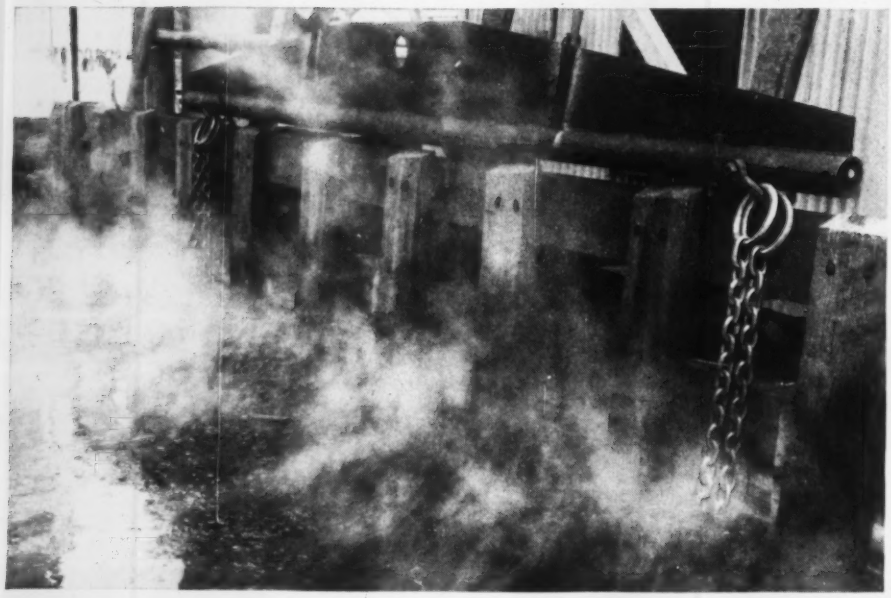
What kind of wire is required to manufacture wire belts that can function perfectly in conditions ranging from minus 40° to plus 1140° Fahrenheit, that can be crimped to a 180° angle at high speed—and resist severe corrosion and abrasion?

Alloy Wire Belt Company, San Jose, California, has the answer: Keystone Galvanized Industrial Wire! They've found it resistant to corrosion, with uniform grain structure and the right specified tensile strength for precision high speed forming. Zinc coating is absolutely uniform and resists flaking.

Keystone and Alloy Wire Belt worked together in developing the right wire for their needs. Confidential counseling and metallurgical assistance will be yours for the asking, too. Call your Keystone man today!

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE WIRE FOR INDUSTRY



7 years on the pickling line Monel chains still have no "weak link"

They resist corrosion, retain high strength, ductility

Take a closer look at these ⅝-inch chains of Monel® nickel-copper alloy.

You'd never know that they've been handling two-ton loads five days a week, for seven years in a 5% sulfuric acid pickling solution at Hammond Iron Works, Bristol, Pennsylvania.

They look as good as new . . . have seven years pickling service behind them, *years of service ahead!*

Monel alloy a natural for pickling equipment

Exceptional corrosion resistance...high strength and ductility that lasts...these are the principal reasons why Monel alloy is a natural for pickling chains...for pickling hooks, slings, tie-rods and baskets, too.

Add up these advantages

1. The high strength of Monel alloy permits you to use lighter equipment to carry greater loads. It's the strongest nonferrous metal you can use.

2. No need to allow for extra metal to offset corrosion. Monel alloy withstands sulfuric acid pickling solutions . . . outlasts other materials many times..

3. Equipment of Monel alloy is easily fabricated, easily repaired.

Get complete information

You'll find details about Monel pickling equipment in a 32-page booklet "Equipping the Pickle House for Greater Production at Lower Cost". For your copy, just write Inco. ®Registered trademark

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

INCO

INCO NICKEL ALLOYS

How Much Steel Capacity Would Operate During a Strike?

12.2%

If the steelworkers strike July 1, 52 producers with annual capacity of 18 million tons (12.2 per cent of the industry) will continue to operate. But don't count on too much help from them because: 1. Their monthly output is less than 1.5 million tons. 2. Some are captive shops. 3. Many are specialty producers. 4. A few will take vacations then. 5. Most are booked up (Page 89).

Metalworking's Net Earnings: Up Substantially from Year Ago

	% change: 1st Qtr, 1959, from 1st Qtr 1958	4th Qtr 1958
Iron & steel	*	+18
Electrical equipment	+17	−31
Machinery	+25	−18
Other metal products	+38	−11
Automobiles & parts	*	+22
Other transportation equipment	−17	+25
Mining & quarrying	+22	−27

Source: First National City Bank of New York.
*Over 100 per cent increase.

How Machine Tool Builders Will Combat Foreign Competition

Look for more American machine tool builders to set up overseas plants. And expect more of them to market foreign machines in this country. A STEEL survey shows that more than one in four U. S. builders have capacity abroad now and 16 per cent more will establish foreign capacity in the next year (Page 96). One in ten domestic builders already market foreign machines in the U. S., and 8 per cent more intend to sign with foreign firms within the next year. England and the Common Market are the most popular choices for foreign operations. This new note is revealed by the survey: Some special machine builders are joining the move to Europe. Until now, nearly all foreign competition was in standards.

How UAW Will Counter Membership Losses

Faced with a better than 20 per cent decline in dues paying members during the last two years, the United Auto Workers is mapping a counterattack. The still big (about 1.1 million members) union will probably move in these two directions: 1. It will set up a new, more extensive, campaign to enlist whitecollar workers; few areas will be sacred. 2. It will attempt a broader

political push aimed at reducing the workweek under the Fair Labor Standards Act (union officials think it will be several years before they can shorten hours through collective bargaining), establishing some kind of government or public supervision or review of industrial price setting, and extending and liberalizing unemployment and welfare benefits. In collective bargaining, look for the UAW to emphasize some form of guaranteed annual wage (SUB is the icebreaker) plus severance pay and relocation allowances.

Ohio Law Is Just in Time for USW

Within a few weeks, the strings will be loosed on the big purses full of Supplemental Unemployment Benefits built up in Ohio during the hassle over SUB's legality. (A new Ohio law legalizes SUB payments.) About $15 million will be paid to union members. It may come in the nick of time for steelworkers, if David McDonald calls a strike on July 1. The retroactive SUB payments would keep striking steelworkers off the hunger list, easing the pressure on union leaders for a quick settlement.

Is It "Great to Live in Michigan"?

The state's slogan may not reflect the true atmosphere. High wage rates and business taxes plus an unemployment burden discourage businessmen from locating their plants in the state. Some are moving out of Michigan to Ohio, Indiana, and Illinois. Others are going south. In 1949, the state accounted for 57 per cent of the nation's automotive employment; the figure dropped to 48 per cent last year. Unemployment climbed from 6.9 per cent of the labor force in '56 to 12.2 per cent this year. The state is attempting to regain its former industrial position (Page 104).

How To Skim to Work

Curtiss-Wright Corp. plans to market an "air-car" in limited numbers. The vehicle skims 6 to 12 in. above the ground. It'll be powered by a conventional piston engine and come in one to four passenger models. Sizes, powers, and configurations will be announced after more market research.

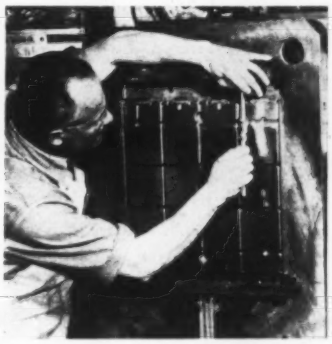
How General Electric Keeps a Customer

Arnold Uggla is materials manager for General Electric's Shelbyville, Ind., plant. But he spends some of his time in the plants of his firm's customers. Reason: He has discovered that a good way to keep clients happy is to investigate their problems first hand. At a cost of 1/10 of 1 per cent of what the customer buys annually, he saves contracts, boosts GE's prestige, and improves the effectiveness of regular sales and service personnel. Moral: Adapting your own methods to better serve your customers can pay big dividends (Page 94).

Demand for Technical Graduates Rises

College recruiters are trying to fill 5 to 10 per cent more positions this year than last, reports University of Michigan. Competition is rugged for technical students, but there has been a slight decrease in demand for non-technical graduates. Starting salaries are up 2 to 10 per cent from a year ago. You'll pay around $400 a month, on the average, for beginning sales people.

Tool and Die Recovery Is Slow



Tool and die shops haven't shared fully in metalworking's recovery. Normally an indicator of the business trend, the industry this year is failing to even parallel metalworking's sales uptrend. One reason is that price fighting has continued. Another reason: Some buyers are waiting to see if the boom is real before socking a lot of money into new tooling (Page 92). Orders will improve with the 1961 auto program this fall.

Romney Asks Limits on Bargaining Power

The nation will suffer from current steel labor negotiations whether there's a strike or not, says George Romney, president, American Motors Corp. "The consumer is rendered ineffective by the excessive concentration of union and employer power," he contends. "The type of collective bargaining that has developed has established pattern bargaining and persuasion by power, not persuasion based on the economic facts at separate enterprises," he says.

A Little Steelmaker Heads for the Big Time

By yearend, Granite City Steel Co., Granite City, Ill., will have 1,584,000 tons of annual ingot capacity. It has tripled capacity since 1951. Two concerted growth programs have boosted its capacity and production at three times the industry average. Current emphasis is on upgrading finishing departments (Page 173). The programs' effectiveness was proved last year when the firm held its earnings within 6 per cent of the 1957 mark.

Peek at 2000 A.D.

The twenty-first century housewife will buy a week's supply of food in 21 prepackaged cartons, selected from more than 100 menus available at the market. She'll push a button and the proper carton will be conveyed from the freezer to the electronic "cooking station" automatically; the food will be cooked as desired with no human effort. Thermoelectric refrigerated

drawers will be found in the family room, den, basement, and maybe the bedroom for a midnight snack in bed. Automobiles will be of three basic types: 1. Electric ones that will cross the nation without recharging and eliminate smog. 2. Cars with conventional engines conducted along highways in which control cables are imbedded so you can "dial your speed" and relax. 3. Vertical take-off and landing carplanes which will be both safe and amazingly fast. Those are the predictions of Charles H. Weaver, vice president, Westinghouse Electric Corp., and Francis K. McCune, vice president, General Electric Co.

Dry Coat Lubricant Slashes Expenses

You may be able to save money on fabricating operations by using a dry coat drawing lubricant. Six large plants (Page 142) are. American Motors Corp.'s Kelvinator Div. reports it lopped 11 per cent off its fabricating costs in stamping appliance cabinets and is saving 20 per cent in cleaning operations. Scrap losses have been slashed 22 per cent due to better die life and easier maintenance.

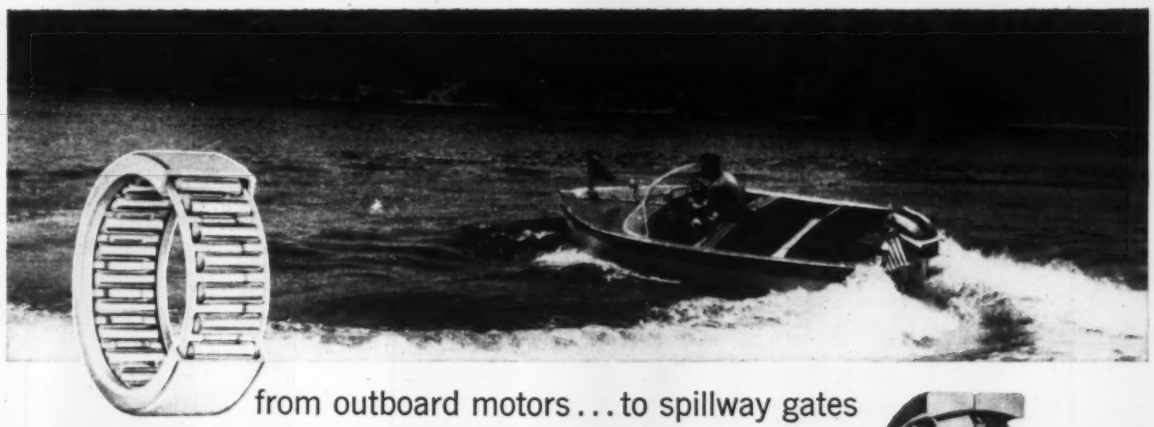
Memorial Day Is Saturday; Who'll Work Friday?

Here's how Detroit area companies are developing work schedules to accommodate the Memorial Day holiday, according to a survey by Employers Association of Detroit. (Most will follow same procedure for July 4):

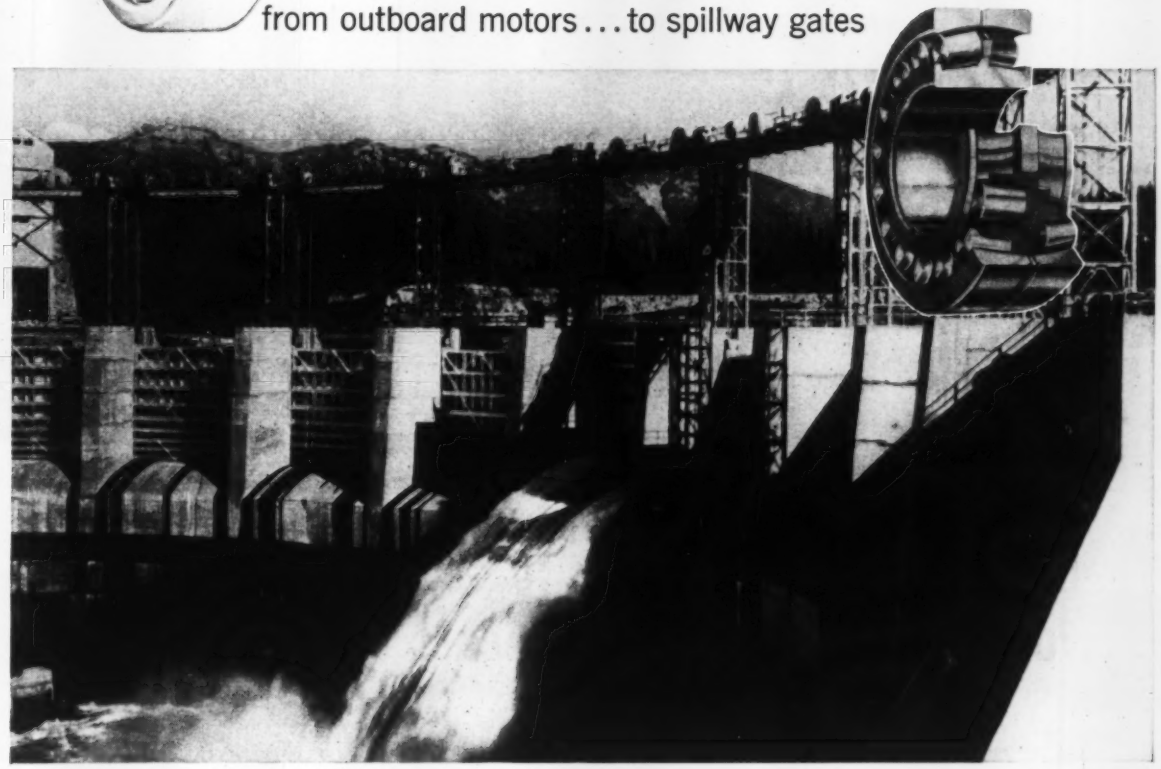
Per cent of companies:	Hourly employees	Salaried employees
Will suspend operation Friday (May 29) and give holiday pay	19	26
Will suspend operations Monday (June 1) and give holiday pay	4	4
Will grant free day with pay later	2	12
Will give holiday pay but no day off	67	18
Will not give time off or holiday pay	8	40

Straws in the Wind

The cold shoulder that the AFL-CIO turned to Teamster boss James Hoffa's threat (a nationwide labor strike if Congress harnesses unions with antitrust laws) probably iced such a walkout for good . . . Expect Congress to be sympathetic to using non-earmarked funds for the interstate highway program . . . Private housing starts set a record for the first four months . . . Aluminum Co. of Canada Ltd. will boost aluminum sheet capacity 33⅓ per cent (10,000 tons a year) . . . Russian machine tool production is running ahead of quotas set in the Seven-Year Plan . . . The Interstate Commerce Commission has O.K.'d a second loan guaranty to a railroad to buy equipment . . . The Atomic Energy Commission and Office of Civil & Defense Mobilization want every home to have a radioactive fallout detector. One might cost only $5 to $10 and attach to a battery radio.



from outboard motors . . . to spillway gates



Torrington makes the right anti-friction bearing for every basic need!

The need may be for a small-section Drawn Cup Roller Bearing to be lubricated once for a long life at high speed. Or for a self-aligning Spherical Roller Bearing to roll up 190 tons of spillway gate under the crushing pressure of water.

Between these two examples lie all kinds of requirements. To meet the broad range of needs, Torrington makes every basic type of anti-friction bearing.

Torrington's broad range of experience can be invaluable in helping you engineer your anti-friction applications. You can rely on your Torrington representative for completely objective recommendations in applying the *right* bearing to your equipment. **The Torrington Company, Torrington, Conn.—and South Bend 21, Ind.**

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

NEEDLE • SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • BALL • NEEDLE ROLLERS • THRUST

. . . but he's been studying to serve your steel needs for 2½ years

New steels are born at Armco

Yesterday this Armco Division salesman was a sales trainee. He doesn't pretend to know all the answers, but behind him and others like him are 2½ years of intensive training designed to help him better serve your special steel needs.

When selected, he may have been fresh from school or service. But it's just as likely he was already an Armco man with practical mill experience. In any case, he was a college graduate with business or engineering background.

The "postgraduate" studies he then began were tough and thorough—complete with lectures, homework and exams. Most important, every step of this initial 1½-year phase of his training program was "*customer oriented.*" This means that he was taught to always think first and foremost of customer requirements—*your* needs—whether studying Armco Special Steels, basic steel-making and fabricating methods or sales techniques, public speaking and business correspondence.

But classroom work was only part of the "prep" period. For at least the next year, on-the-job training in an Armco Sales Office as a sales correspondent helped lay a firm groundwork of practical commercial experience.

As he calls on his first prospect, his formal training is over. He's now a full-fledged Armco Sales Representative. But he will never stop learning ways to serve you faster, better, more efficiently. Armco Steel Corporation, 2269 Curtis Street, Middletown, Ohio.

ARMCO STEEL

ARMCO®

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

Our Vanishing Markets

American metalworking industries are feeling the bite of foreign competition—at home and abroad.

We already have lost some markets—watches, sewing machines, bicycles, tableware.

Now the bite is going deeper into those great industries in which we traditionally have had an unquestioned advantage—machine tools, automobiles, steel products, and others.

The reasons are simple: Western European and Japanese industries have built modern plants, often with U. S. financial aid, installed new machinery and equipment, adopted the latest and most efficient methods. They have narrowed any technical advantage we once held.

More importantly, their wages are but a fraction of ours. European industries pay one-fourth to one-third the rates U. S. workers get. Japanese scales are about one-seventh of ours.

The net result: These politically friendly competitors can undersell us anywhere.

And too few Americans seem to care.

American workers are not yet aware that their jobs are being exported.

Government fails to realize how sharply its revenue sources are dwindling.

Industry, aware of the inroads being made in its markets by increased imports and decreased exports, has yet to find a solution.

This may be the gravest problem to be faced by America in the next decade. It will get much worse before it gets better. It could cause us to become a lame duck nation industrially.

Artificial restraints on trade are hardly an answer. While we will hear pleas for protective tariffs, import quotas, and Buy American campaigns, they can be, in a world suddenly grown smaller, only expedients.

The problem must be attacked at its roots: At the narrowing margin of technical supremacy and, more particularly, at the wide disparity in wage costs.

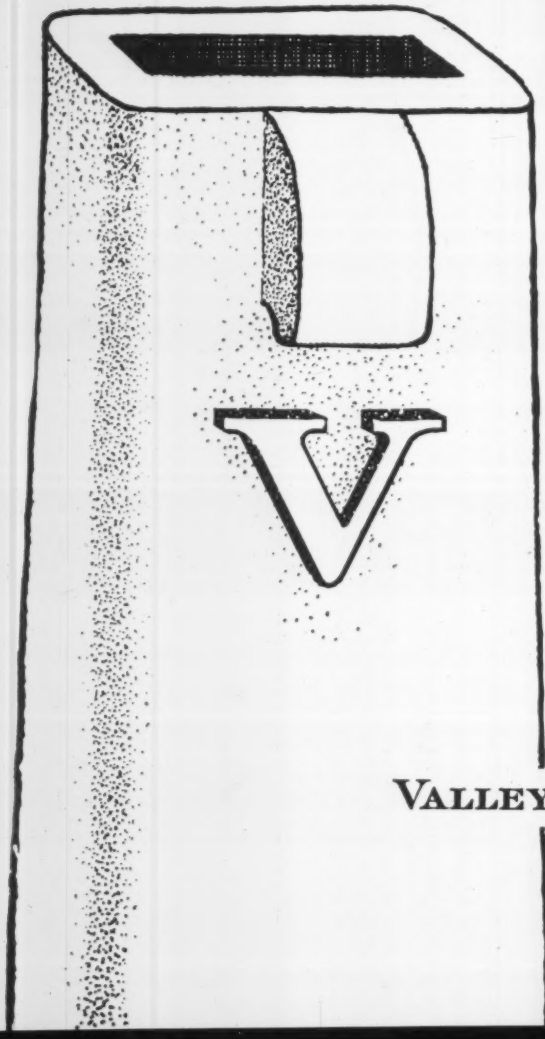
Labor must recognize that it is pricing itself out of the market.

Government must encourage industry to become as efficient as possible, through constructive tax revisions and depreciation reform measures.

Industry will have to arm itself with every cost cutting tool available, restore its margin of productivity over that of foreign competitors, and hold the line against broadening the already too wide wage disparity.

Walter J. Campbell

EDITOR



Tomorrow

we'll harness the energy of the sun . . . . .

but even then

steel will be poured into

VALLEY INGOT MOULDS

VALLEY MOULD AND IRON CORPORATION

GENERAL OFFICES: Hubbard, Ohio
WESTERN OFFICE: Chicago, Illinois
NORTHERN OFFICE: Cleveland, Ohio

If USW Strikes, These Will Operate

Ingot Producers	Location	Annual Ingot Capacity (Net Tons)
Alan Wood Steel Co.	Ivy Rock, Pa.	800,000
Armco Steel Corp.	Middletown, Ohio; Butler, Pa.	3,114,000
Babcock & Wilcox Co.	Beaver Falls, Pa.	229,450
Baldwin-Lima-Hamilton Corp.	Burnham, Pa.	188,710
Borg-Warner Corp., Ingersoll Steel Div.	New Castle, Ind.	64,000
Braeburn Alloy Steel Corp.	Braeburn, Pa.	20,730
A. M. Byers Co.	Ambridge, Pa.	90,000
Cameron Iron Works Inc.	Houston	58,800
Carpenter Steel Co.	Reading, Pa.; Bridgeport, Conn.	171,500
Columbia Tool Steel Co.*	Chicago Heights, Ill.	6,600
Continental Steel Corp.	Kokomo, Ind.	420,000
Edgewater Steel Co.	Oakmont, Pa.	117,600
Erie Forge & Steel Corp.	Erie, Pa.	284,000
A. Finkl & Sons Co.	Chicago	33,600
Florida Steel Corp.	Tampa, Fla.	43,000
Ford Motor Co.	Dearborn, Mich.	1,898,600
Harrisburg Steel Co.	Harrisburg, Pa.	100,750
Heppenstall Co.	Pittsburgh; Philadelphia	213,250
Industrial Forge & Steel Inc.	Canton, Ohio	84,000
International Harvester Co., Wisconsin Steel Div.	Chicago	1,200,000
Isaacson Iron Works Inc.	Seattle	102,000
Joslyn Mfg. & Supply Co.	Ft. Wayne, Ind.	37,500
Keystone Steel & Wire Co.	Peoria, Ill.	475,000
Kilby Steel Co.	Anniston, Ala.	34,020
Knoxville Iron Co.	Knoxville, Tenn.	38,000
Laclede Steel Co.	St. Louis	600,000
Latrobe Steel Co.	Latrobe, Pa.	24,000
R. G. LeTourneau Inc.	Longview, Tex.	90,000
Lone Star Steel Co.	Dallas	800,000
Merritt-Chapman & Scott Corp.	Milton, Pa.	90,000
Mesta Machine Co.	New Castle, Pa.; West Homestead, Pa.	171,000
Mississippi Steel Co.	Flowood, Miss.	45,000
National Forge & Ordnance Co.	Irvine, Pa.	25,000
National Steel Corp., Weirton Steel Co. Div.	Weirton, W. Va.	3,300,000
Newport News Shipbuilding & Drydock Co.	Newport News, Va.	15,000
Northwest Steel Rolling Mills	Seattle	53,000
Northwestern Steel & Wire Co.	Sterling, Ill.	825,000
Oregon Steel Mills	Portland, Oreg.	150,000
Pencoyd Steel & Forge Corp.	Philadelphia	15,600
H. K. Porter Company Inc.	Birmingham; Huntington, W. Va.; Aliquippa, Pa.	234,600
Roanoke Electric Steel Corp.	Roanoke, Va.	25,000
Simonds Saw & Steel Co.	Lockport, N. Y.	21,600
Southern Electric Steel Co.	Birmingham	66,000
Southwest Steel Rolling Mills	Los Angeles	45,000
Texas Steel Co.	Ft. Worth, Tex.	132,450
Timken Roller Bearing Co.	Canton, Ohio	700,000
Union Electric Steel Corp.	Carnegie, Pa.	25,000
Universal-Cyclops Steel Corp., Empire-Reeves Steel Corp. Div.	Mansfield, Ohio	500,000
Vanadium-Alloys Steel Co.	Latrobe, Pa.; Monaca, Pa.	42,000
Washburn Wire Co.	Phillipsdale, R. I.	93,000
Wickwire Bros. Inc.	Cortland, N. Y.	32 440
Yuba Consolidated Industries Inc., Western Rolling Mills Div.	Helena, Ariz.	60,000
Totals ..... 52 Companies		18,005,800

*Will be on vacation from July 3 to July 20. Expects to operate thereafter.

IF THE STEELWORKERS go out on general strike this summer, don't count on much help from mills that will continue to operate.

Five reasons: 1. Even though 52 producers won't be hit, they account for only 12.2 per cent of the industry's capacity. Their combined monthly output is under 1.5 million tons, and the product mix is out of balance with demand. 2. Several of the larger ones are "captive" shops, with all output going for their own needs. 3. Many of the smaller companies make specialty steels with limited applications. 4. Several report that they will take their annual vacations during the strike—if it comes. 5. Practically all are booked solid through the period of any likely strike.

• **Down from '56**—If the United Steelworkers pull a general strike, as they traditionally have, the steel consumer will be harder put to find domestic sources of supply in 1959 than he was in 1956. (For the import picture, see STEEL, May 18, p. 55.) During the month-long strike three years ago, 64 companies with annual capacity of more than 23 million ingot tons continued to operate—18 per cent of capacity then.

Fourteen of those companies, with current annual capacity of almost 10.5 million tons, are missing from the list at left. Some have disappeared through mergers. The union has organized others. A few had contract expiration dates other than June 30 in 1956, but some of those dates now coincide with Big Steel's deadline. A few companies are new to the list, having been formed since 1956.

Another significant fact brought out by STEEL's survey is that contract extensions, which were common in 1956, will be scarce in 1959.

• **The Missing**—Prominent among the missing names in the list are: Copperweld Steel Co., Detroit Steel Corp., Granite City Steel Co., Kaiser Steel Corp., McLouth Steel

Corp., National Supply Co. (now a part of Armco Steel Corp.), and Rotary Electric Steel Co. (part of Jones & Laughlin Steel Corp.).

• **All-Out Effort**—This survey adds further weight to the belief that the union will call a general rather than a selective strike on July 1 if a new contract has not been reached (see story at right). Some feel the union had this in mind when it pushed back the expiration date of their contracts to June 30. Others see the lack of extensions as a sign of an all-out strike. A few tell STEEL that they are feeling union pressure to close down on July 1 if there's a strike even though they have never done so before. (Many steelmen say their workers have no taste for a strike this year.)

However, one of the larger companies which operated during the 1956 steel strike says that it thinks there is a chance it may do so again this year because the union will use divide and conquer tactics as the auto workers did in 1958.

The companies in the accompanying list fall into three categories laborwise: 1. Those with no union. 2. Those with a union other than the USW. 3. Those with USW contracts expiring after June 30 (most common date is July 31). Regardless of the union situation, most will automatically grant their workers the same settlement that USW works out with Big Steel.

With this assurance, USW has granted a few extensions where conditions warrant. One tool steelmaker reports it already has an extension because some of its competitors that have another union will be operating. USW realizes a shutdown would put the company in an unfair competitive position and might result in lost jobs.

• **Creeping Paralysis**—If a strike should go beyond 30 days, the supply of domestic steel will dwindle rapidly. Not only will more contracts expire, but nonintegrated producers will also be forced to shut down. Several tell STEEL that they will have enough ingots and billets on hand to last from four to six weeks. Some rail steel barmakers will be in business as long as they can get acceptable rails, but their tonnage is limited.

Selective Strike in Steel?

Its' possible but not probable if labor negotiations reach an impasse. Union might consider the strategy if government and member pressure is strong against a general walkout

A JULY STRIKE in steel still looks likely.

Even through the dimout in news about negotiation progress you can see that both sides retain their original positions—a no-cost-hike stand by the companies, a substantial - increase-in-wages-and-benefits stand by the union.

• **What Kind of a Strike?**—It's too early for the United Steelworkers to decide precisely what the strategy will be in case of a strike, but it's undoubtedly considering the merits of a selective walkout. Odds are strongly against such a move, but it remains a possibility. The companies consider it to be enough of a threat to investigate ways to combat the strategy with a mutual aid plan (STEEL, May 18, p. 57). Because of legal problems, they haven't come up with much anybody in top management can be enthusiastic about.

Mutual aid problems may be academic when you consider the pros and cons of a selective strike.

• **The Pros**—Two arguments could persuade the USW to strike only one or a few of the major steel companies.

1. There's no doubt that USW President David McDonald could pull all his steelworkers out, but there's also no doubt that he doesn't want to. His members had a rough year in 1958, and 50,000 are still not back at work. He'd have less grumbling among the membership if he struck only one or a few companies.

2. He wants to avoid government intervention, and he'd be more likely to do so if he doesn't disrupt the whole industry and economy with a general walkout. A selective strike would be safer.

• **The Cons** — Several arguments will probably dissuade the union against a selective strike if the negotiations lead to a walkout in July.

1. The union wants a uniform contract because it's far easier to handle than dissimilar pacts. It would be tough to get the same contract via selective strategy.

2. Not since 1941 (when it got basic steel almost entirely organized) has the union struck a part of the industry to force a new contract on the whole. Its style of bargaining (and striking) on a substantially industrywide basis has been highly successful. Steelworkers are among the highest paid in the world.

3. All the bargaining procedures are set up on the industrywide basis. A few steel companies don't bargain in the general setup (see Page 89), but they're special cases. And they're less numerous than in 1956—52 now vs. 64 three years ago.

Speculation about divide-and-conquer tactics bobs up during every steel labor hassle. The union has never struck selectively. The reasons for doing so this time may be stronger than ever before, but they still may not be potent enough to persuade the USW to deviate from tradition.

Ore Giant in Lake Service

S. S. Shenango II, a 710 ft ore carrier in the 25,000 ton class, recently entered Great Lakes service at Cleveland. It will transport ore and coal for the Shenango Furnace Co., Pittsburgh.

The $8 million carrier, built at the Toledo works of American Ship Building Co., Cleveland, will operate mainly between Lake Erie ports and Snyder Mining Co. properties in Minnesota. The vessel is also designed for service in the salt water regions of the St. Lawrence Seaway.

The new ore carrier has a depth of 37½ ft and beam of 75 ft, a girth which will require careful handling through the 86 ft locks of the Soo and Seaway. The *Shenango*, powered by a General

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Corp., National Supply Co. (now a part of Armco Steel Corp.), and Rotary Electric Steel Co. (part of Jones & Laughlin Steel Corp.).

• **All-Out Effort**—This survey adds further weight to the belief that the union will call a general rather than a selective strike on July 1 if a new contract has not been reached (see story at right). Some feel the union had this in mind when it pushed back the expiration date of their contracts to June 30. Others see the lack of extensions as a sign of an all-out strike. A few tell STEEL that they are feeling union pressure to close down on July 1 if there's a strike even though they have never done so before. (Many steelmen say their workers have no taste for a strike this year.)

However, one of the larger companies which operated during the 1956 steel strike says that it thinks there is a chance it may do so again this year because the union will use divide and conquer tactics as the auto workers did in 1958.

The companies in the accompanying list fall into three categories laborwise: 1. Those with no union. 2. Those with a union other than the USW. 3. Those with USW contracts expiring after June 30 (most common date is July 31). Regardless of the union situation, most will automatically grant their workers the same settlement that USW works out with Big Steel.

With this assurance, USW has granted a few extensions where conditions warrant. One tool steelmaker reports it already has an extension because some of its competitors that have another union will be operating. USW realizes a shutdown would put the company in an unfair competitive position and might result in lost jobs.

• **Creeping Paralysis**—If a strike should go beyond 30 days, the supply of domestic steel will dwindle rapidly. Not only will more contracts expire, but nonintegrated producers will also be forced to shut down. Several tell STEEL that they will have enough ingots and billets on hand to last from four to six weeks. Some rail steel barmakers will be in business as long as they can get acceptable rails, but their tonnage is limited.

Selective Strike in Steel?

Its' possible but not probable if labor negotiations reach an impasse. Union might consider the strategy if government and member pressure is strong against a general walkout

A JULY STRIKE in steel still looks likely.

Even through the dimout in news about negotiation progress you can see that both sides retain their original positions—a no-cost-hike stand by the companies, a substantial - increase-in-wages-and-benefits stand by the union.

• **What Kind of a Strike?**—It's too early for the United Steelworkers to decide precisely what the strategy will be in case of a strike, but it's undoubtedly considering the merits of a selective walkout. Odds are strongly against such a move, but it remains a possibility. The companies consider it to be enough of a threat to investigate ways to combat the strategy with a mutual aid plan (STEEL, May 18, p. 57). Because of legal problems, they haven't come up with much anybody in top management can be enthusiastic about.

Mutual aid problems may be academic when you consider the pros and cons of a selective strike.

• **The Pros**—Two arguments could persuade the USW to strike only one or a few of the major steel companies.

1. There's no doubt that USW President David McDonald could pull all his steelworkers out, but there's also no doubt that he doesn't want to. His members had a rough year in 1958, and 50,000 are still not back at work. He'd have less grumbling among the membership if he struck only one or a few companies.

2. He wants to avoid government intervention, and he'd be more likely to do so if he doesn't disrupt the whole industry and economy with a general walkout. A selective strike would be safer.

• **The Cons** — Several arguments will probably dissuade the union against a selective strike if the negotiations lead to a walkout in July.

1. The union wants a uniform contract because it's far easier to handle than dissimilar pacts. It would be tough to get the same contract via selective strategy.

2. Not since 1941 (when it got basic steel almost entirely organized) has the union struck a part of the industry to force a new contract on the whole. Its style of bargaining (and striking) on a substantially industrywide basis has been highly successful. Steelworkers are among the highest paid in the world.

3. All the bargaining procedures are set up on the industrywide basis. A few steel companies don't bargain in the general setup (see Page 89), but they're special cases. And they're less numerous than in 1956—52 now vs. 64 three years ago.

Speculation about divide-and-conquer tactics bobs up during every steel labor hassle. The union has never struck selectively. The reasons for doing so this time may be stronger than ever before, but they still may not be potent enough to persuade the USW to deviate from tradition.

Ore Giant in Lake Service

S. S. Shenango II, a 710 ft ore carrier in the 25,000 ton class, recently entered Great Lakes service at Cleveland. It will transport ore and coal for the Shenango Furnace Co., Pittsburgh.

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Tool and Die Shipments
(Millions of dollars)
1959 . . . . . $1100*
1958 . . . . . $ 925
1957 . . . . . $1275
1956 . . . . . $1400
1955 . . . . . $1115
Source: NTDMA.
*Estimated by STEEL.

Diemakers Suffer; '61 Cars May Help

THE RECOVERY in the tool and die industry is short of expectations. Shipments picked up in February after a 22 month slump, and the upturn extended into March, but new orders in March were 12 per cent below the pace in the same month last year.

Backlogs have been building slowly since August. (They're now 14 per cent above year-ago levels.) Leadtimes are shortening. Some shops are expanding their work forces and operating 50 to 55 hours a week. March showed the largest employment gain in many months, although a number of companies are still plodding along at last year's average workweek (40 to 45 hours).

The industry may turn the corner by summer. "But it could be another disappointing year," cautions George Eaton, executive vice president, National Tool & Die Manufacturers' Association. A minority of respondents to a STEEL survey think that 1959 will be worse than 1958. (Shipments fell to $925 million last year vs. about $1.3 billion in 1957.) But the consensus is business will improve 12 per cent.

• **Why?** — The situation puzzles many. Mr. Eaton offers one reason for the extended slump: "Metal manufacturers are managing with their present tooling. When they're sure the boom is real, they'll heavily invest in new tooling."

• **Autodom Has Key**—"The greatest single factor for our recession is the curtailment of automobile tooling programs," reports a Pennsylvania firm. Dollarwise, shops in Detroit suffered a 10 per cent decline last year, but the quantity of work remained fairly stable (largely because of price fighting).

The 1961 auto program will be "one of the biggest ever," enthuses a Motor City diemaker. Work is to begin in late August and September. Ford will require 6 million hours of tool and die work. General Motors has scheduled sheet metal changes on all lines. Chrysler is due for extensive reworking.

• **Cutthroat Pricing** — Automakers are soliciting bids from shops outside Michigan in an attempt to push costs down. They're also dickering with foreign firms. Lower labor costs have enabled some Wisconsin and New England outfits to bid $4 to $5 an hour. Detroit shops have bid as low as $6.50 to $7, but the "best work" goes for $8. Foreign firms have bid $2 to $3.

"Price cutting is the rule rather than the exception," charges an Illinois company. The industry's overcapacity has promoted "panic bidding," states a New York tool-

maker. "The government's policy of allowing prime contractors to subcontract helps promote price battles," declares another New Yorker.

A few die sets are selling for less than the makers pay for plates at a steel service center. Some engineered die supplies are selling for less than catalog goods.

A midwest company reports Cleveland and Dayton, Ohio, Indianapolis and South Bend, Ind., are the most competitive pricewise. It charges: "Rates are $4 to $4.50 when they should be $6 to 8."

Half of STEEL's respondents predict a price increase this year. And 18 per cent said they would be up as much as 10 per cent.

• **Other Problems**—Tooling requirements are expected to decline in the future. The drop in manned aircraft has created a gap. Missiles need less tooling and stamping. Re-usable dies, interchangeable parts, and the pirating of old dies result in fewer die changes. More companies are doing their own work. "And the cost of a complete retooling job is almost prohibitive," remarks an Ohio manufacturer.

• **Outlook Mixed**—Specialized shops are faring best. Small shops and fringe outfits have a bleak outlook. A Detroit manager says: "The Grade A shops are doing well. The inefficient ones are in trouble. We're just going through a weeding out process."

"The steel companies made a profit at only 55 per cent of capacity. We could too if the industry were stable," muses an Ohio die supply executive.

• **Foreign Competition**—Most firms surveyed denied losing business to imports. But many "knew" of companies which were facing overseas competition.

"This foreign business is overrated," scoffs a diemaker. Automakers were accused as the biggest "offenders." ("A typical out-of-Michigan reaction," retorts a Detroit toolmaker. "We're not hurting.") A Cleveland diemaker says the Big Three have hired dozens of diemakers to finish imported dies.

The toy industry is reportedly buying molds and dies from West Germany and England. Japan is said to be supplying stamping firms.

A leading diemaker bid $12,000 on a California job. The same carbide die could be obtained from England for $7000, including all duties and transportation—and delivered four weeks sooner! The buyer said the foreign die was good enough for the job. He promised to return to the domestic fold when he needed a quality product.

• **New Developments**—Interest in plastic tooling has died down. Applications appear to be limited to short runs and prototype work. Tape control is expected to be "really big," as soon as central area jobbers set up programing.

That will come about within five years, says a Michigan machinemaker.

Mill Supply Sales Hit Peak

American Supply & Machinery Manufacturers' Association sees 1959 volume at $4.5 billion, compared with the previous high of $4.4 billion in 1957

SALES of industrial supplies and equipment are breaking all records. While some strike hedge buying is going on, most purchases are for direct consumption.

Fred C. Emerson, new president of the American Supply & Machinery Manufacturers' Association, predicts that this year's sales will reach $4.5 billion, topping the industry's previous high of $4.4 billion in 1957.

The ASMMA adjusted new order index stood at 221 in March, matching the all-time high established in January, 1957. Mr. Emerson, vice president of Spartan Saw Works Inc., Springfield, Mass., expects the index to jump to about 235 in April and May, settle back between 210 and 220 in the third quarter, and bounce up to 235 or 240 in the last quarter.

Fred C. Emerson is the new president of the American Supply & Machinery Manufacturers' Association

Consumer inventories of industrial supplies are again mounting to the 90 day level or better—about as they were in 1957. Inventories fell off to zero in 1958 when annual sales declined to $3.8 billion.

• **Despite the record business outlook, prices on some lines are chaotic.**

On hacksaw blades, for example, distributors still are often willing to sell small quantities at large lot prices by erasing most of their profit margin. Other affected lines include twist drills, American pattern files, and cutting tools.

Imports, not yet a problem, may begin to exert pressure.

• **Distributors are worried about direct selling by manufacturers.**

The manufacturers feel that the distributing organizations are understaffed. They also maintain that technical people are needed to figure out product applications, make customer service calls.

The distributors, in defense, plan to develop better trained salesmen, with less sales staff turnover, and to concentrate on fewer lines of the more profitable goods.

1. GETS COMPLAINT ". . . and I'm placing my next order with your competition," Arnold Uggla, GE materials manager, hears from valued customer

2. WHAT HAPPENED? By prearrangement with manufacturing manager, C. M. Stevens, Mr. Uggla heads for a day with the customer

How GE Visited, Retained Customer

CUSTOMERS respect a factory staff. Take advantage of it.

That's the advice of Arnold Uggla, materials manager, General Electric Co., Shelbyville, Ind. "Top staff people can often clear up trouble far more easily than sales or service representatives. We find it pays big dividends in contracts saved, and increased prestige and effectiveness for regular sales and service personnel."

• Here's the story behind the GE approach.

About a year ago, Mr. Uggla learned that a major customer was about to switch his next order for heating elements to a competitor. The reasons: Orders were continually over or under quantities specified; deliveries were often 12 to 24 hours late; paperwork wasn't being handled the way the customer liked.

GE could easily have rationalized the loss: Orders had to be made in batches because of a wide variety of shapes and sizes; rejections always left orders a few pieces over or under the requisition, and it was cheaper to ship "as is" than rush a few pieces through production or hold back an inventory; the customer insisted on picking up his order late at night after the shipping dock was closed; and he had five different ways of ordering parts.

But GE wanted the customer. Determined to find out whether the customer really needed such service, Mr. Uggla spent a day finding out. He learned that: 1. Competition in appliances is so rough that there is no margin for inventory. When the customer gets an order for 1000 appliances, he orders components for 1000, no more, no less. 2. The customer's truck made the Shelbyville stop last to improve efficiency of multiple-stop schedules. 3. Contract problems with a wide variety of customers caused the variations in paperwork.

• Learning why changed the GE attitude, fostered a greater desire to help.

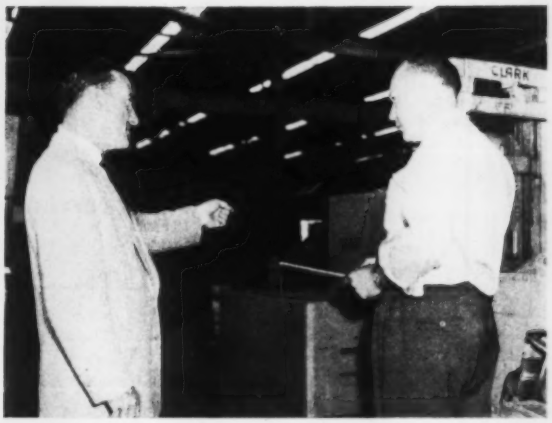
Mr. Uggla's visit impressed the customer. He postponed the switch so Shelbyville could adjust its production methods.

Now orders are shipped on the nose and on time. Ways were found to adjust to the customer's paperwork routine.

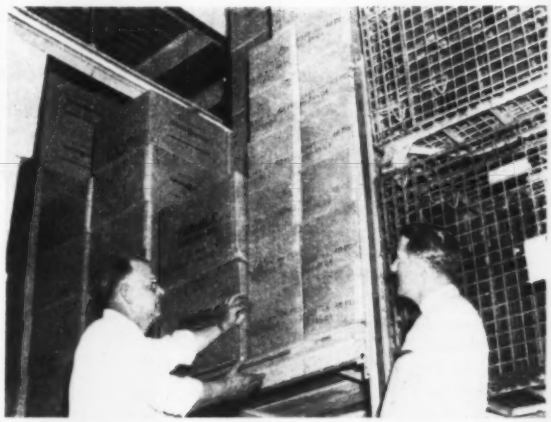
Cost: 1/10 of 1 per cent of what the customer buys each year.

Result: The customer is still a customer.

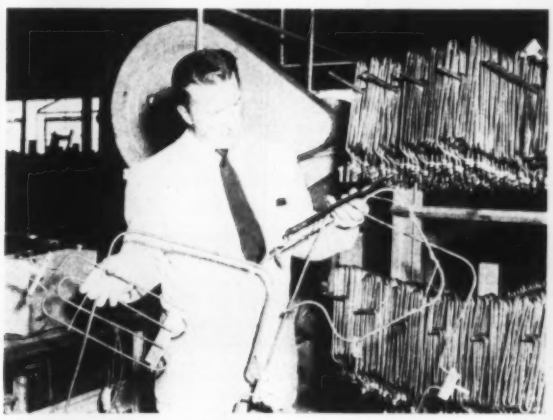
3. "SIX HOURS LATE," the customer complains. "I had to send these people home . . . lost half a day's production and delayed my shipments"



6. "FILL IT EXACTLY," Mr. Uggla tells his foreman. "Hold the order until the makeup units are finished. Work overtime if you have to"



4. "HOLDING THE BAG . . . that's what I'm doing every time you short my orders. Here's what six lousy pieces can do." Customer shows incompleted units in storage



5. COMES THE DAWN. Mr. Uggla sees why the customer has been ordering such a wide variety of shapes. Customer needs variety to meet competition

7. PATIENCE, MR. UGGLA. You've learned your customer's problems are real, important. You'll find a way to adapt your methods, too

Machine Tool Capacity Goes Abroad . . .

More than 25 per cent of the U. S. builders have capacity overseas.

(32 of 115 respondents to STEEL survey have.)

Sixteen per cent more intend to establish foreign capacity in the next year.

(17 of 115 respondents say they probably will.)

and Builders Market Foreign Machines Here

Ten per cent of the domestic builders have signed with foreign firms.

(12 of 115 respondents will.)

Eight per cent more intend to sign up in the next year.

(9 of the 115 say they probably will.)

FACED with the unhappy prospect of increasingly heavy competitive losses, the U. S. machine tool industry has launched a drive to regain its share of the world market.

At the heart of the drive is an exodus of domestic machine tool capacity—to Europe. Then, to boost their competitive prowess in the U. S., some builders are signing up to market foreign machines here.

• Foreign plants will let U. S. builders throw off a host of handicaps.

Here's the problem: Foreign machine tools are good; some are excellent. Their prices range 20 to 50 per cent under those of American machines. They meet with fewer national restrictions, quotas, and currency exchange problems than do the American machines. The answer: Foreign capacity for U. S. builders.

Of the 32 STEEL survey respondents who have foreign capacity, 14 own their own plants, 16 have licensed foreign builders to manufacture their machines, and two have set up subcontracting agreements. Several have combinations of the approaches.

England is probably the most popular choice for a foreign operation, since it is the largest single potential market for many builders. The advent of the common market, however, is shifting some interest to operations on the continent.

• Special machine builders now join the move to Europe.

With few exceptions, U. S. machines built abroad have been standards. Builders of the specials have been able to compete in the foreign markets by building their equipment here and exporting it.

Even that picture is changing. Joseph H. Buhr, president, Buhr Machine Tool Co., Ann Arbor, Mich., and a leading builder of specials, points out: "The birth of a special machine tool industry abroad has us facing their tough competition overseas, and we may soon face the problems of foreign competition here."

Of the 17 builders that figure they are likely to set up foreign capacity in the next year, six are leaders in the special machine and automation field. As one pointed out: "Our plans to move abroad reflect three things. First, we can compete better abroad against our American competitors. Second, we can compete better against the new European special machine tool builders. Third, we can, if it becomes necessary, build machine components at Europe's costs and bring them back into the U. S."

• Few builders will import foreign built machines.

Three builders that have foreign capacity told STEEL they have shipped components back into their home plants.

Of the builders who told STEEL they have signed to market foreign-originated machine tools in the U. S., only four import them. The rest build the foreign designs here.

• Another tack for the U. S. market: Build and sell a low cost machine.

Five other builders are using the same approach as Sheldon Machine Co. (See story at right.) One of them, Lapointe Machine Tool Co., Hudson, Mass., has come out with a bench size broaching machine that sells for only $970.

Heald Machine Co., Worcester, Mass., offers a universal internal grinding machine that sells for $12,000. An additional $12,000 was knocked out of the price by design steps like simplifying the drive and hydraulic system, using standard machine units. Heald management figures the $12,000 is equivalent to a 1947 price.

• Few builders like the idea of a mass export of machine tool capacity, but they figure it's a must if thev're to survive in the world market place.

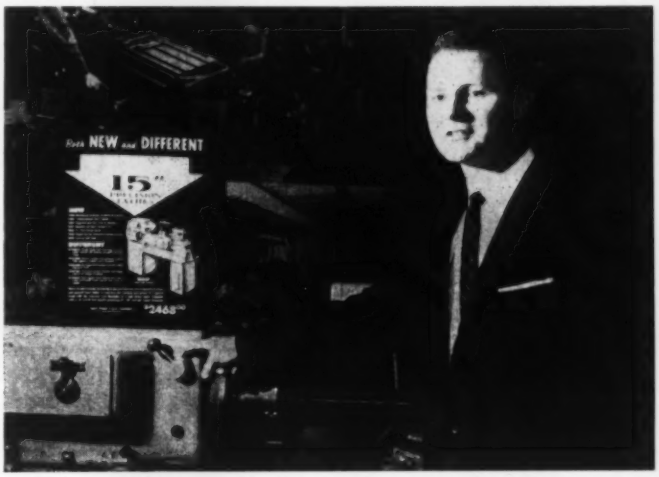
Ralph J. Kraut, president, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., and president, National Machine Tool Builders' Association, says it is now likely that the physical volume of machine tool imports is greater than the exports. And the trend of both curves is against the domestic builder.

The exodus of domestic machine tool capacity may have become a necessity—an undesirable, but workable, solution. The only other apparent choice: Build in this country, which many would prefer, but face a waning export market.

Convinced that the capacity to build machine tools (and other capital goods) is an important part of our economic and defense base, many builders fear the long range consequences of placing a good portion of that capacity abroad.

Burnell A. Gustafson, vice president of machine tool operations, Sundstrand Corp., Rockford, Ill., believes domestic builders should manufacture at least some of each of their lines (including those imported) in their U. S. plants. He feels it's a minimum requirement to protect our defense base.

Builder Aims at a Competitive Price



Sheldon's Howard B. Carroll: "We feel this type relatively inexpensive lathe can handle as much as 80 per cent of the turning jobs in the average plant."

SOME aggressive machine tool builders try to remain competitive with foreign equipment by tailoring their products for markets.

Case in point: Sheldon Machine Co. Inc., Chicago, felt that the slot between the belt driven lathe and the geared head lathe wasn't adequately covered by American builders. Because of the improved quality of imports, foreign builders were taking a bigger slice of the market.

Sheldon brought out the 15 in., R Series lathe last fall. Since then, the company has sold over 150 machines and expects to sell at least that many more within the next six months.

Explanation: Apparently, the customer gets, and pays for, only the machine features he needs. The basic machine sells for about $2600.

Howard B. Carroll, vice president, says: "To give a man a machine for this price, we offer this new lathe with a completely new headstock. This headstock, which now has four gears instead of the previous 12, can be coupled with a Lima gear transmission in the base of the machine and provide pulling power equal to that of our full geared head lathes. Items such as a one shot oiling system, standard tapered spindle, hardened bed ways, and apron control are optional at extra cost. If the customer feels those items are merely frills, he may leave them off the base machine and keep his investment to a minimum."

Mr. Carroll says the machines, when equipped with the same equipment as foreign counterparts, are about 10 per cent more than the imported version. But without the extras, the Sheldon lathe is priced as much as $500 under the foreign makes.

All Sheldon lathes are built to NMTBA toolroom lathe standards, to assure the user of precision.

Mr. Carroll says: "We estimate that as much as 80 per cent of the lathework being done in the average plant can be done with machines of this type. This is the market to which we've tailored our product."

Tax Inquiry Unlikely to Yield Major Tax Cuts

MANEUVERING on Capitol Hill for a tax cut has begun. First round: Wilbur Mills (D., Ark.), House Ways & Means Committee chairman, has announced "an extensive inquiry into the opportunities for constructive reform of the federal tax system." Public hearings begin Nov. 2 (well after Congress recesses). Every element of our society will be heard by the committee, including economists, private tax research organizations, businessmen, and union representatives.

Recognizing the nature of the present boom, Mr. Mills thinks it's possible to develop some tax cuts without sacrificing government revenue. Higher corporate profits and higher personal income mean tax rates can be lowered.

For business, Representative Mills hopes to achieve "a tax climate more favorable to economic growth." Depreciation reform has not been singled out for study by the committee, but chances are it will be considered.

Crux: Don't get too excited about the prospects for tax cuts. Only relatively minor reforms could result. The Democrats resist being labeled "prounion" (by advocating huge personal income tax cuts) or "antibusiness" (by refusing to recommend any corporate tax cuts). The Republicans will tend to offer a better break on such matters as depreciation reform. Somewhere between those extremes, sound thinking by legislators like Mr. Mills may triumph.

Renegotiation Hearings Offer Lesson

Business may have learned a lesson in how to deal with Representative Mills as a result of hearings on the extension of the Renegotiation Act. It is said that Mr. Mills saw little willingness by business to compromise with extremists like Rep. Carl Vinson (D., Ga.), who cry "profiteer" against defense contractors. Neither did he believe, it is reported, that business offered the committee much constructive help in its efforts to bring out a better bill. He concluded it would be easier to extend the Renegotiation Act for four years rather than have a meaningless hassle every year or two.

Lesson: A moderate approach may bring quicker tax reforms than the "all or nothing" attack made by such representatives of business as the National Associaion of Manufacturers and the U. S. Chamber of Commerce. The middle-of-the-road legislator resists identification with either group or the AFL-CIO if he has the chance.

Congress Pressures AEC

Look for the Joint Atomic Energy Committee to add about $46 million to President Eisenhower's Atomic Energy Commission budget for fiscal 1960. The total will still be less than the $386 million Congress O.K.'d last fiscal year, notes Rep. Chet Holifield (D., Calif.), Some increases are for additional prototype reactors to hasten domestic development of electricity generating atomic plants. The committee is generally critical of the administration's lack of speed.

One of the last acts of Deputy Defense Secretary Donald A. Quarles was to approve plans for a true atomic powered plane, say Pentagon sources. Congress has criticized the White House on this issue, claiming the Russians will have an A-plane before us. If Mr. Quarles did O.K. a prototype plane (Convair would build it), you can expect the White House to follow his advice. General Electric will have a prototype engine ready by 1961. Airframe contracts must be let soon to coincide with the engine development.

Ike Turns Heat on Congress

For a change, President Eisenhower did a little pressuring of his own last week. He told Congress he wants gasoline taxes boosted to keep the federal highway program on schedule. He also asked immediate passage of a housing bill giving the Federal Housing Administration authority to insure $6 billion in home loans. Both programs are in serious danger of disruption, he charged, because of Congressional squabbles.

His recommendation may help speed legislation, but he will not get the sort of law he wants. Congress is almost certain to refuse to raise gasoline taxes. And it will likely pass a housing bill which includes plenty of dollars for public housing and urban renewal, programs which Ike wants cut sharply.

Defense Contracting Notes

Testimony of Carl Hokanson on small business' subcontracting problems was given to the Senate Government Procurement Subcommittee, not to the House Special Investigations Subcommittee, as indicated by STEEL (May 11, p. 108) . . . Advanced Research Projects Agency, the Pentagon's space office, is publicly referring to itself as "The Fourth Service." Air Force efforts to junk the agency continue . . . Sign of the times: The first ballistic missile sub will be christened June 9; the last of the Navy's conventional powered subs was launched May 16 . . . The Army has awarded a $7.5 million contract to a French firm for antitank missiles.

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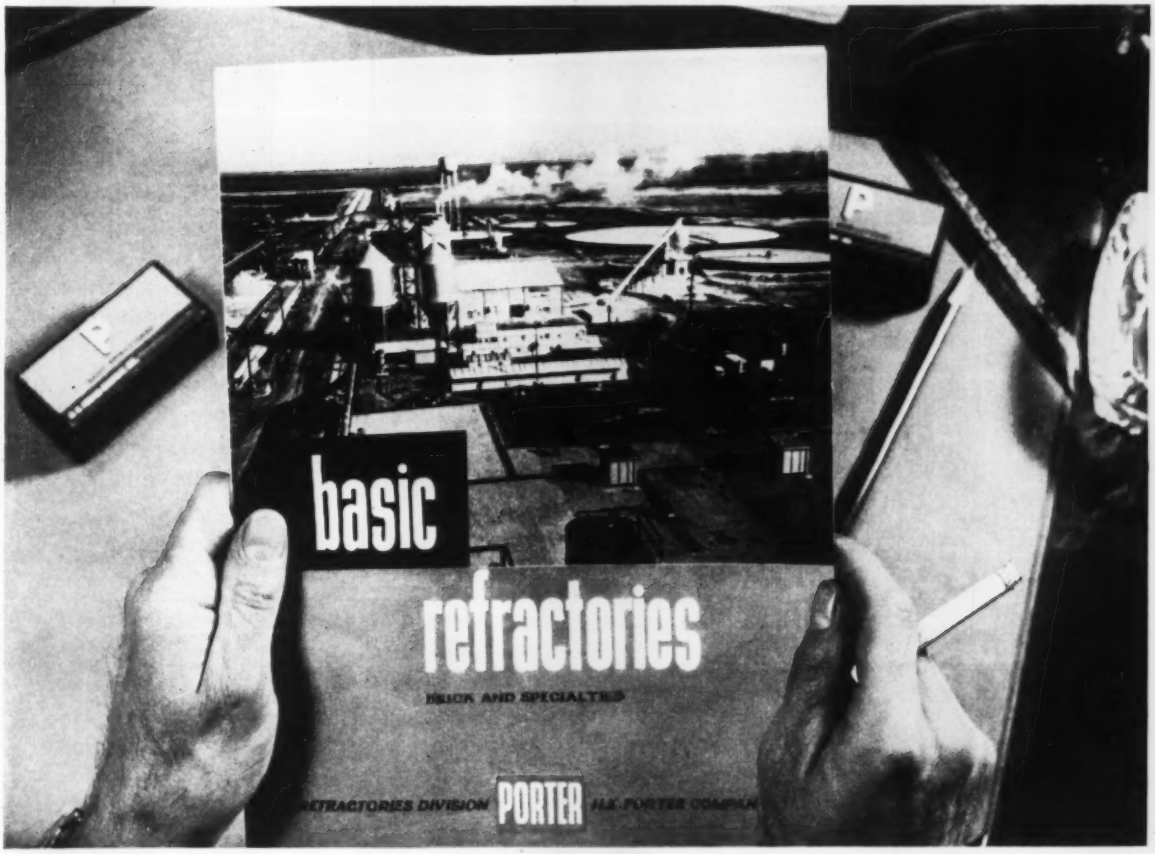

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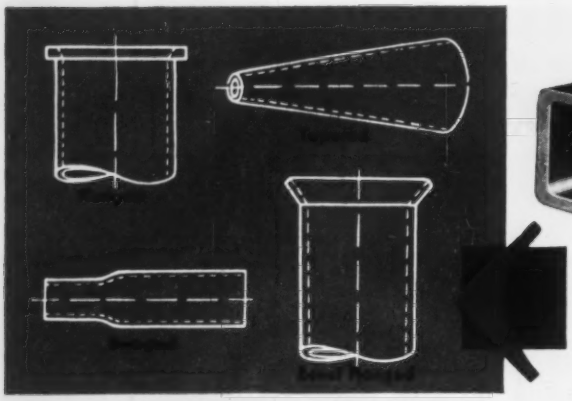

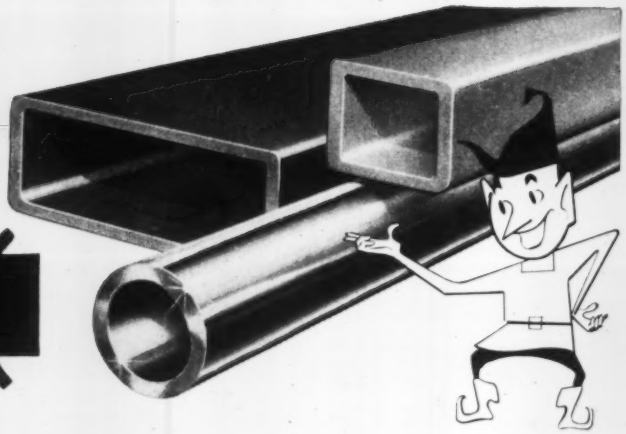

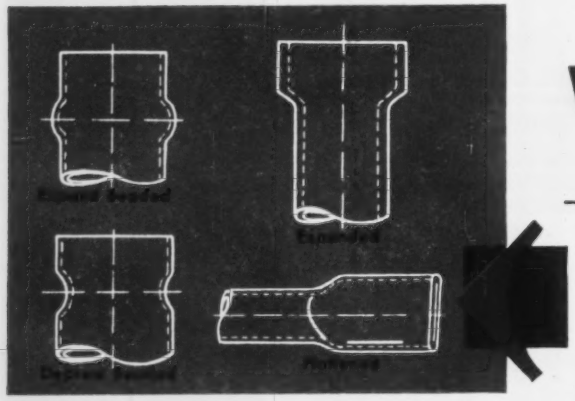

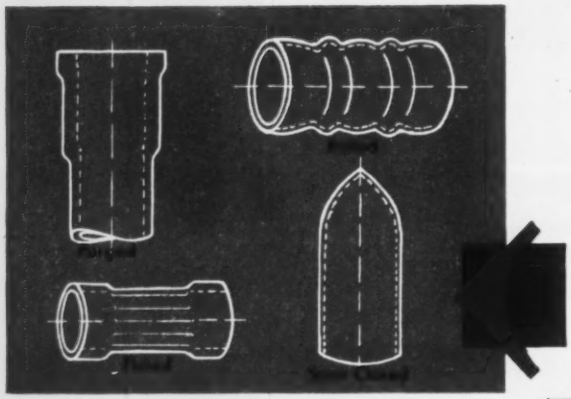

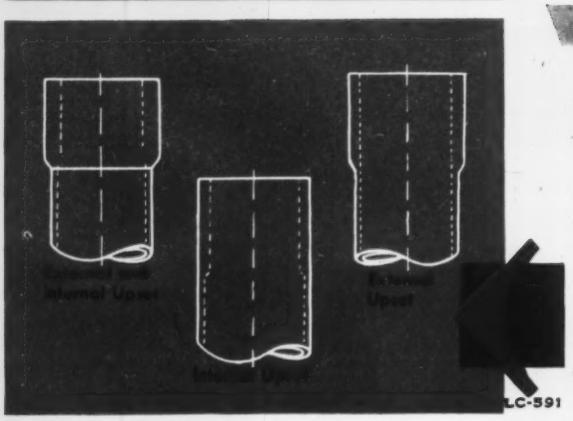

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Methane Carrier Brings New Market to Metalworking

EMERGING NEW MARKETS for natural gas will mean new markets for metalworking. A converted cargo ship, carrying 35,000 barrels of methane, is proving that it's practical to ship refrigerated and liquefied natural gas from the Americas to Europe.

The ship (the 5000-ton *Methane Pioneer*, see picture) is jointly owned by British Methane Ltd., a Bahamian corporation formed by the Gas Council of Great Britain and Constock International Methane Ltd. Constock is owned by the Union Stock Yard & Transit Co. of Chicago and the Continental Oil Co. of Houston.

• **What It Means**—The ships and equipment needed for the project would greatly benefit metalworking.

Regular shipments are about three years off. They'll probably be from Caracas, Venezuela, to Great Britain. But Constock eventually hopes to have a fleet of 30 to 40 ships carrying liquefied natural gas to markets all over the world.

Equipment will include liquefaction and storage facilities near Caracas and vaporization and storage facilities near London.

E. F. Battson, president, Constock International Methane, says: "The success of this program is a tremendously significant technical achievement and a boon to the economy of many countries." He points out that Constock intends to provide liquefaction plants in foreign areas where large volumes of natural gas are available. It is unlikely that much, if any, gas will be exported from this country. Reason: It's cheaper elsewhere.

• **Why Do It**—Constock officials point out that manufactured gas costs Britishers more than imported natural gas and has less than half the Btu count. Result: Replacing manufactured gas with natural gas doubles the capacity of British gas mains.

• **Problems**—Liquefying the gas has been the sticker. It involves cooling it to -285° F and keeping it there. Besides being difficult, it has proved extremely dangerous. But Constock officials, while they keep methods secret, say they have licked both problems.

When liquefied, methane contracts to 1/600 its original volume. One barrel of liquid methane equals about 3500 cu ft of gas. That property makes it economically feasible to ship.

• **When**—No one at Constock will say when regular shipments will begin. The *Methane Pioneer* ship is just finishing her second trip. Bids have not been taken on the full sized tankers; the best guesses are it'll be two to three years before they're ready.

Meanwhile, work is progressing on setting up potential markets. Constock men all over the world are digging for signs of interest—with encouraging results. Typical reaction: "Show us it can be done, and we'll be interested in buying it from you."

Original work on the project started in 1952 when Union Stockyard & Transport began research on the feasibility of shipping liquefied natural gas from the Southeast.

General Electric's new program for Automation through Modernization can help you . . .

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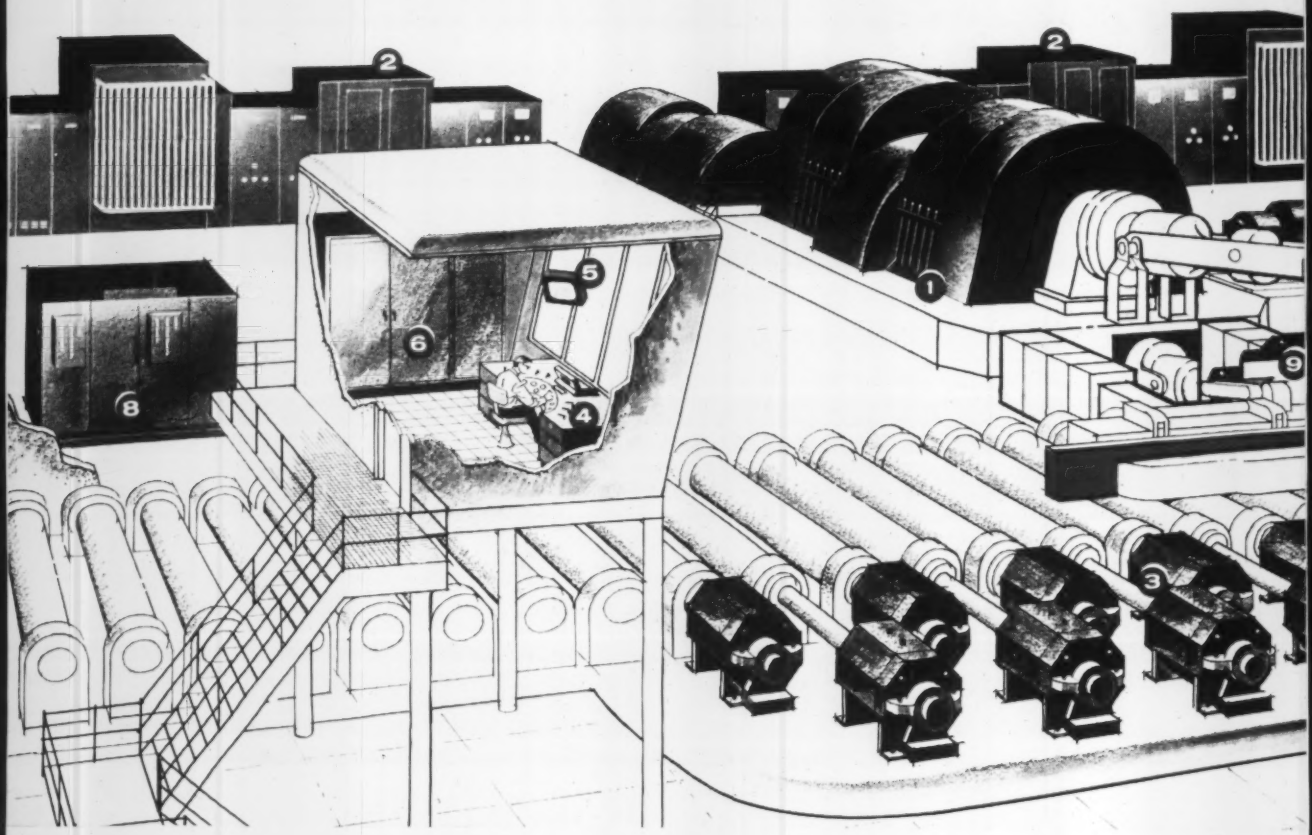

Above is General Electric's version of a completely automated reversing hot mill. While your facility may differ, the products and technology for automation are available from General Electric today.

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5. Closed-circuit TV gives operator visual contact with remote and inaccessible mill operations.
6. Data processing equipment can record data, set up operating guides, and ultimately control the process using the GE 312 general purpose, digital control computer.
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10. Hot metal detectors note when metal is "in zone," initiate next step in operation. This saves rolling time, increases accuracy.

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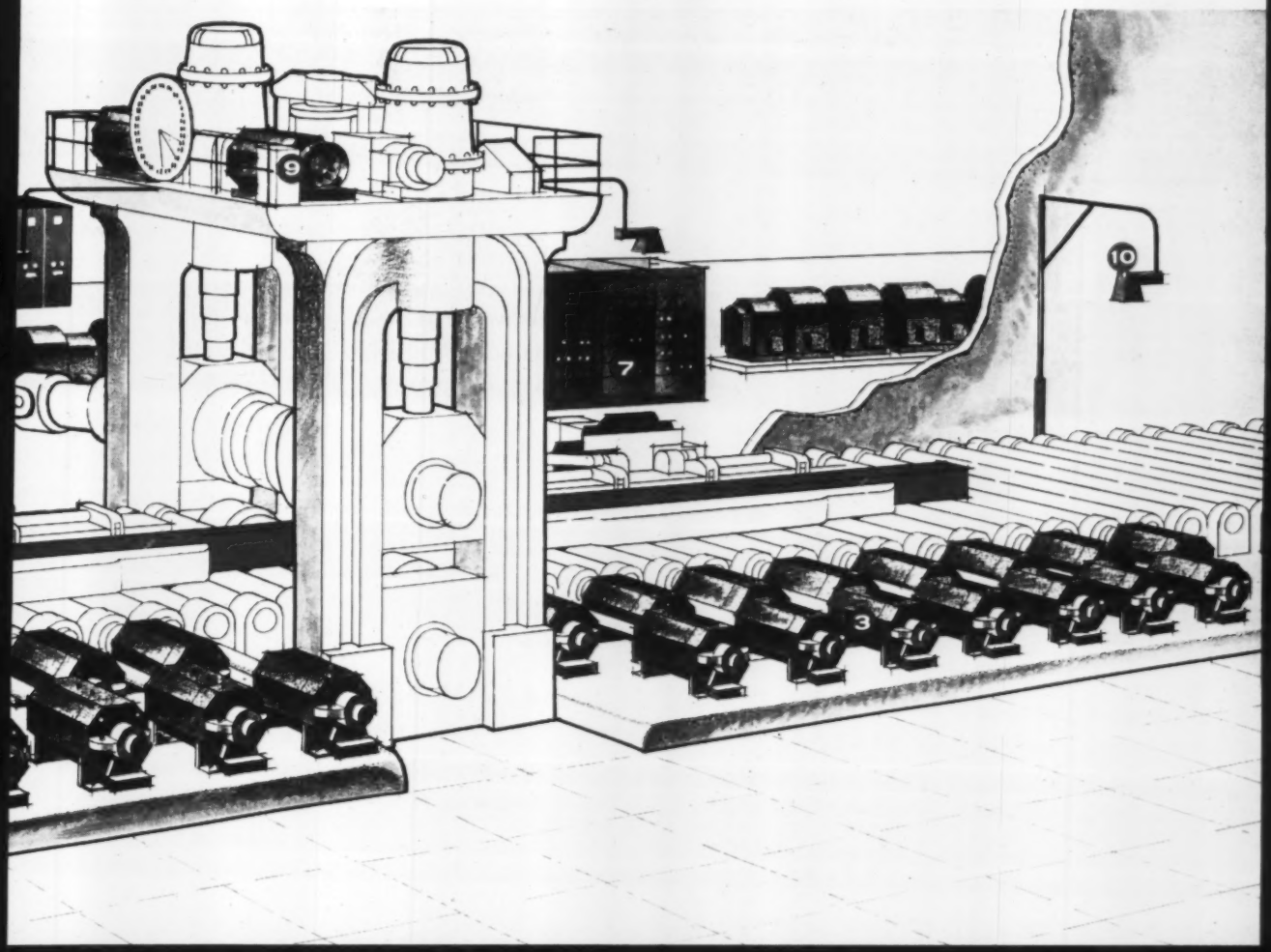

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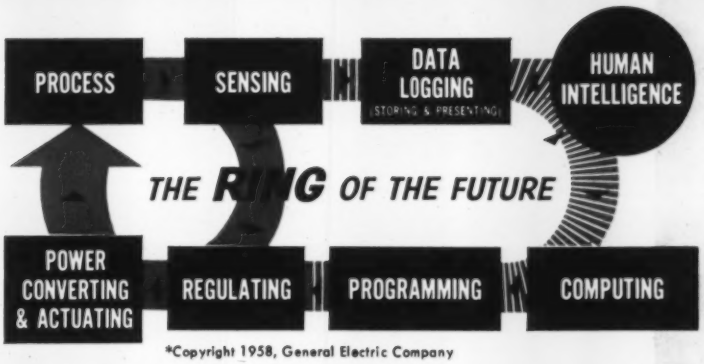

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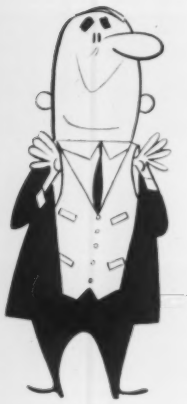

TO SOLICIT NEW BUSINESSES, many smaller Michigan towns are establishing industrial development boards. Such an organization in Berrien Springs (pop. 1700), gambled $30,000 to entice a Welcraft Products Co. Inc. plant from New Carlisle, Ind.

Welcraft is an automotive and appliance supplier. It agreed to move if a suitable plant could be obtained. Civic officials found the only answer was to build one costing $64,000. They raised $30,000 from townspeople without telling them the name of the prospective company. The bank at nearby Niles, Mich., loaned the rest. The money will be paid off with receipts from Welcraft which is buying the plant on a land contract.

Production starts in July. Employment: About 60. Welcraft says it's making the move because of the agreement and because it moves the plant closer to suppliers and markets.

. . . How Many Will Move There?

WAGES—Michigan's hourly wage rate averages $2.46. The national average is $2.14, says the U. S. Department of Labor.

EMPLOYMENT—Between 1950 and 1956, Michigan's manufacturing employment decreased 0.17 per cent. Ohio, Indiana, Wisconsin, and Illinois showed an average increase of 9.4 per cent. Michigan and Rhode Island were the only states showing job losses.

TAXES—Between 1949 and 1958, revenues from corporate franchise and business activity taxes climbed from $6 million to $112 million. Unemployment compensation payments went from $69.1 million to $232 million, while the number of corporations in the state reportedly increased less than 12 per cent. Although population rose only 24 per cent, local property taxes doubled.

Other manufacturing states have similar problems, but Michigan's have come to a head more quickly. Other industrial regions will want to see what has happened in Michigan and how the state hopes to solve its problems

DRAW A LINE from the top of Michigan's lower peninsula down through the center of the state. It cuts through the capital, Lansing. More important, it's the dividing line for the political and economic conditions at the heart of Michigan's financial crisis and industrial depression. The state is treating the symptoms, but has no quick cures.

• **A State Divided**—To the line's west, the primary businesses are agriculture and tourists. The dominant political party is Republican. Tourists bring in half a billion dollars worth of business each year. They vie with agriculture as the second largest revenue producer. The seven industrialized cities in these areas have a labor force of only 500,000; the state has 2.9 million.

• **Against Itself**—To the east of the line lies Detroit and the auto industry which, with its allied metalworking trades, brought Michigan its "arsenal of democracy" title. Two-thirds of the state's labor force is in the Detroit area and up the narrow "metalworking corridor" through Pontiac, Flint, Bay City, and Saginaw. When Detroit booms, these workers are rich. When cars don't sell, they're poor. Political strength is organized around the Democratic party and the United Automobile Workers.

• **Struggles Against Schism**—Since '49 when Democrat G. Mennen Williams became governor, he has faced opposition from a Republican dominated legislature. For every bill a Republican legislator pushed through, he usually had to support a Democratic project. Republicans often disagreed among themselves. UAW directed Democrats were organized and the Republican majority dwindled. Result: The cost of government soared. So did taxes.

• **Despite High Taxes** — The state levies business, vehicle, sales, and intangible taxes. Cities and counties collect personal property taxes. In Detroit, the combined city and county personal property tax is almost 5 per cent on 84 per cent of assessed valuation. That's a big bite for plants with heavy investments. Adjusted for inflation, tax revenues rose some 76 per cent in the last nine years. Population increased 24 per cent. Per capita income went up about 40 per cent. Businessmen believe this proves that more of the tax load is being paid by industry.

One example is the business activities tax, which was nonexistent in 1949. It brought in $61 million last year. Using Michigan as a base of 100, one study shows the average tax on industries is 40 per cent in Illinois, 53 per cent in Indiana, 62 per cent for New York and New Jersey, 44 per cent for Ohio, 73 per cent in Pennsylvania, and 82 per cent in Wisconsin.

• **Lost Businesses**—With population rising faster than the national average (24 vs. 11 per cent), wage rates and taxes among the nation's highest, and market groups becoming scattered, manufacturing industries with heavy employment began consolidating operations, transferring them to other parts of the state, and closing down.

How much industry has entered or left the state is highly controversial and most figures are biased, but the Corporation & Securities Commission reports that 38,500 firms paid franchise fees in fiscal 1957. It adds that 2500 to 3000 new companies were formed that year, but in 1958, only about 1000 companies were organized or moved in.

In '56 and '57, Michigan spent $199 million for new industrial construction while Indiana spent $898 million and Ohio, $921 million. Prof. William Haber, University of Michigan economist, says the state accounted for 57 per cent of the nation's automotive employment in 1949. Last year the figure dropped to 48 per cent. Since World War II, GM has established 14 plants in Ohio. Ford has built nine, and Chrysler now has six manufacturing facilities in Ohio and Indiana.

• **And Fewer Jobs** — Discussing a recent study, Dr. Charles L. Jamison, professor emeritus at the University of Michigan, says: "The state should have gained 270,663 production jobs between 1947 and 1956 if its industrial growth had kept pace with the average rate. It actually fell behind the average to the tune of 228,136 production jobs." A *Detroit News* survey points out: "As late as 1954, Michigan led all major states in factory employment per capita. In the last three years, however, Michigan has been passed by Ohio and Indiana. In 1957, Michigan's 132 industrial employees per 1000 population dropped substantially under Ohio's 146."

Detroit has suffered most. Area employment in metalworking and transportation (automotive) industries fell from 470,000 to 316,000 between 1956 and 1958. The state's unemployment rose from 6.9 per cent in '56 to 12.2 in '59.

• **Comeback Is Slow** — Michigan slowly is marshaling its forces to hold the industry it has and to win new firms. It needs them to supply jobs to a mounting labor force (2.9 million now vs. 2.85 million in '56). The state's Economic Development Department has laid out a six point program to help businessmen with problems. Example: Encourage local universities to turn out more scientists to attract small scientific companies.

• **More Diversification** — It looks like Michigan's industrial makeup will change. Companies will be smaller, more diversified. They'll be located in smaller cities where local taxes are comparable to national averages. They'll hire nonmanufacturing workers whose wage rates also are more comparable. Chemical, electronic, soft goods, and service industries seem logical candidates.

• **But Less Metalworking** — One thing seems pretty definite. Until wage and tax structures undergo some basic realignment, manufacturers with heavy labor content and sizable plant and equipment investments will not be too interested in Michigan.

Detroit probably will never recover its industrial strength. Some of its labor will have to relocate.

• An extra copy of this article and one to appear June 1 (on how states are trying to lure new industries) will be available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

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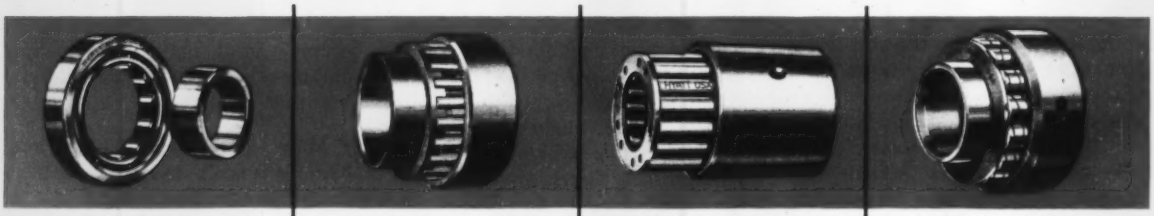

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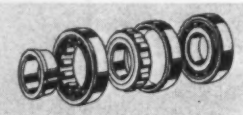

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Nylon resin is used for speedometer and windshield wiper gears, as well as other parts. Du Pont says some 250 different parts of Zytel nylon resin are used in 1959 cars. Other automotive uses for plastics include: Bushings for brake and clutch pedals, window cranks, steering columns, door hinges, air suspension parts, dome lamp lenses, door latch wedges, carburetor parts. Delrin instrument clusters can have printed circuitry and color cast in

Du Pont Boosts Plastics for Autos

PLASTICS PRODUCERS are convinced there's a larger market for their products in the cars Detroit will be building over the next ten years. They must convince car designers that plastic parts can be made just as inexpensively as metal parts, and that they'll do the job as well, if not better.

About 2 lb of plastic materials were used in the average car in 1946. Today, the average is about 18 lb, says a spokesman for E. I. du Pont de Nemours & Co. Inc., Wilmington, Del. Du Pont claims 314 automotive applications for its products now; it believes the number will at least double in the next five years.

• **Can Save**—Dr. John D. Young, manager of Du Pont's Plastic Sales Div., says the automotive industry saved $3 million (70 cents per car) through the use of his company's plastic products in 1958. He estimates it can save $45 million by 1964. To accomplish this, Du Pont is approaching the market with much the same pitch aluminum companies used when they first started touting the light metal's advantages. The idea is to prove to designers that it's the finished piece price that counts—not the base material cost. The company emphasizes that injection molding and part redesign will cut finishing costs and permit several parts to be combined into a single assembly.

• **The Pitch**—Says Dr. Young: "In the late 1940s, nylon resin sold for $1.60 a pound. The price of Teflon originally was $18 a pound. Today the nylon molding powder sells for $1.18 and Teflon at about $4. Compared with copper, zinc, and brass it's evident that no one would substitute a $1.18 plastic for a 13.5 cent metal, all things being equal."

But, as Dr. Young points out, all things aren't equal. He adds: "Injection molding is a highly versatile fabrication process which eliminates many, and often all, of the costly finishing processes required when working with other materials. The plastic part usually is ready for service when it leaves the mold. Secondly, plastic engineering materials not only will replace conventional materials, but often will

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make possible the elimination of components required in a conventional design." He cites a check valve which originally contained ten parts. Du Pont redesigned it so the valve contained only six parts. Costs were cut 68 per cent.

• **Example** — How can Du Pont's latest plastic product, Delrin, which costs 95 cents a pound, compete with zinc at 13 cents and aluminum at 25 cents? The company uses as an example a typical automotive part (it could be a door handle or carburetor part) that would be produced in quantities ranging from 50,000 to 250,000. The part weighs 2 ounces in Delrin, 3.7 ounces in aluminum and 9.3 ounces in zinc. It's injection molded in plastic rather than diecast in metal.

Assuming only such moderate finishing operations as flash removal, drilling, and reaming are needed on the metal parts, finished per piece costs would be 26 cents for Delrin, 24 for zinc, and 23.5 for aluminum. Du Pont adds that the 95 cent material cost figure is the introductory market price; it expects volume production to bring the cost down to 80 cents. In practice today, partmakers pay closer to 11.5 cents a pound for zinc and 22 cents for aluminum. However, if extensive machining operations requiring jigs and fixtures are needed, the finished cost would be almost double for the cast metal parts compared with the plastic.

• **Materials**—Du Pont is offering five types of plastics whose temperature, strength, and frictional characteristics are highly competitive with diecast metals for many automotive parts:

Lucite, an acrylic resin. It has good optical properties and can be painted or metallized on the reverse side so the coloring shows through, but is not exposed to weather.

Teflon, an extremely high temperature and chemical resistant fluorocarbon resin often used to coat missile wiring. It creates little friction and is a good insulator.

Delrin, an acetal resin. Its best qualities are strength, stiffness, dimensional stability, and temperature resistance.

Zytel (nylon resin). It has better abrasion and impact resistance than Delrin, but its strength, stiffness and stability characteristics are not quite as good.

Alathon (polyethylene). It's used for coatings because of its flexibility and insulating properties.

• **Markets**—Here's how Du Pont thinks the use of its products will grow in the next five years:

Automotive Consumption
(pounds, avg car)

	1959	1964
Lucite	1.8	2.0
Teflon	0.001	1.0
Zytel	0.5	1.5
Alathon	1.0	1.8

• **Future**—Among the new products Dr. Young expects to see are oil pumps, timing gears, and radiator fans made from nylon resins. He thinks Delrin can be used for nonlubricated ball joints, steering column and instrument cluster housings. It's already rumored that two GM hardtops will have one piece, molded plastic headliners in 1960. Du Pont cites that as a possible use for Delrin.

Lucite grilles could replace aluminum and zinc diecast jobs. They may be less costly and definitely will be corrosion resistant. They could be metalized or molded in clear or custom color resins. Ford reportedly has such a development project underway.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,112
March	576,085	357,049
April	578,825	316,503
4 Mo. Totals	2,179,151	1,555,179
May		349,474
June		337,355
July		321,053
August		180,324
September		130,426
October		261,696
November		514,099
December		593,920
Total		4,243,526

Week Ended	1959	1958
Apr. 18	135,934	73,219
Apr. 25	133,987	58,664
May 2	118,059	78,434
May 9	134,763	78,506
May 16	135,822†	87,407
May 23	135,000*	86,589

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Rosy Glow in Forecasts

Continued economic expansion now confirms earlier predictions that car sales will reach 6 million units, including imports, asserts George P. Hitchings, manager of Ford Motor Co.'s Economic Analysis Dept. He adds that the steel industry may cause a temporary leveling off in the third quarter because of its present high levels of activity.

"Steel production will drop close to current consumption rates in the third quarter even if a strike does not occur. The related drop in payrolls and profits dependent on steel production will also act as a temporary drag on the total economy," he declares.

Expanding on Mr. Hitching's forecasts, C. R. Beacham, vice president and assistant general manager of Ford Div., says car sales in the next two quarters will be 35 to 40 per cent ahead of year ago periods. He adds that fourth quarter sales should be much better than any fourth quarter since 1955.

Continues Mr. Beacham: "The amount spent for new automobiles will rise to $21 billion annually by 1965, up from $15 billion spent in 1957. By the end of the decade, automobile expenditures will reach $26 billion."

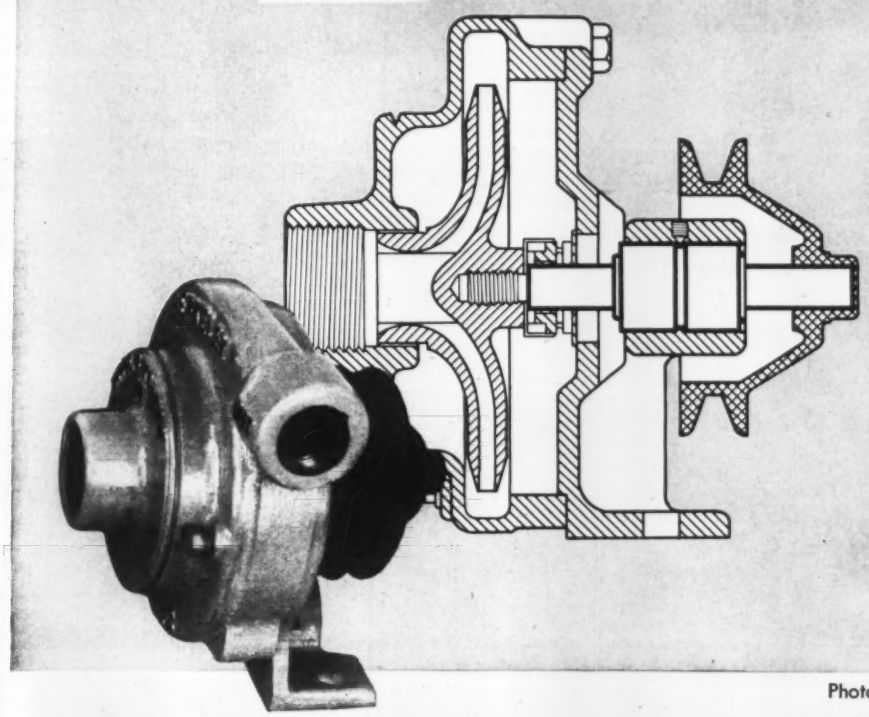
Exhaust Notes

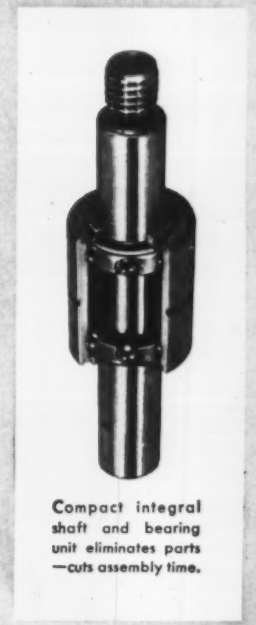
• Studebaker-Packard Corp. reports Lark sales are 221 per cent ahead of the year ago period. The company delivered 12,547 cars in April vs. 3904 units in April, 1958.

• Chrysler's Dodge Div. says its four door body styles are making a revival. Four door sedans are taking 43.8 per cent of this year's production compared with 39.7 per cent last year and 38.9 per cent in 1957. Four door hardtops are up from 11.2 to 12.1 per cent.

• The annual replacement bill for mufflers is $290 million, reports Allegheny Ludlum Steel Corp., Pittsburgh. It's now testing stainless steel mufflers that may last a lifetime. The company claims present mufflers corrode in 15,000 miles or 18 months.

CASE HISTORIES





Compact integral shaft and bearing unit eliminates parts —cuts assembly time.

Photo: Courtesy Berkeley Pump Co.

N/D Ball Bearings Help Cut Size... Lower Costs $2.50 Per Pump!

CUSTOMER PROBLEM:

Redesign utility water pump for Air Conditioner market. Conversion must achieve smaller size without reducing pump capacity. At the same time, customer must lower over-all production costs.

SOLUTION:

N/D Sales Engineer suggested the versatile New Departure fan and pumpshaft ball bearing. This compact precision bearing permitted use of over-the-housing pulleys with belt load located over the raceway. Its integral shaft, which is the inner race, simplified design and helped reduce housing size without changing pump capacity. In addition, the sealed and lubricated-for-life bearing replaced two sealed bearings, separate shaft and snap rings . . . cutting part and assembly-time costs $2.50 per pump.

Perhaps one of New Departure's wide selection of *production* ball bearings will help give *your* product the sales appeal and cost savings you're looking for. For more information, call the New Departure Sales Engineer in your area or write Dept. T-5.

Replacement ball bearings available through United Motors System and its Independent Bearing Distributors

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DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

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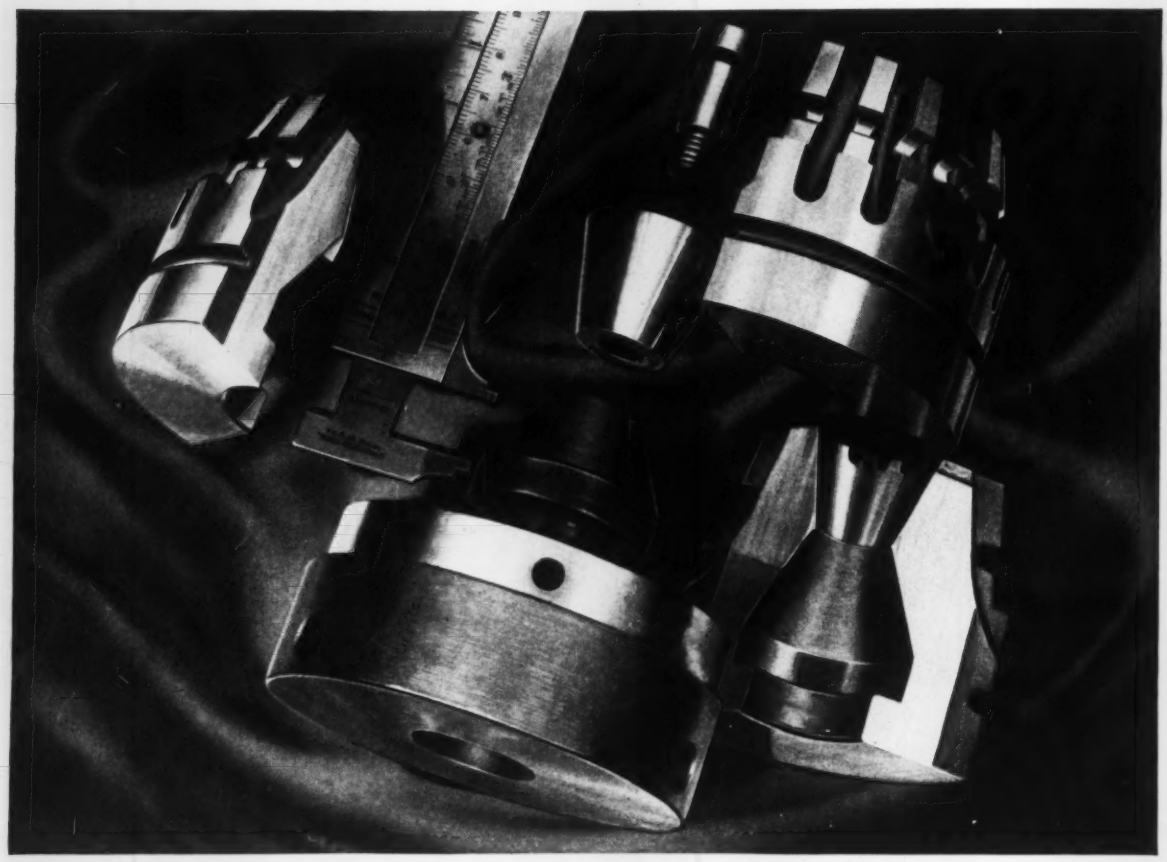

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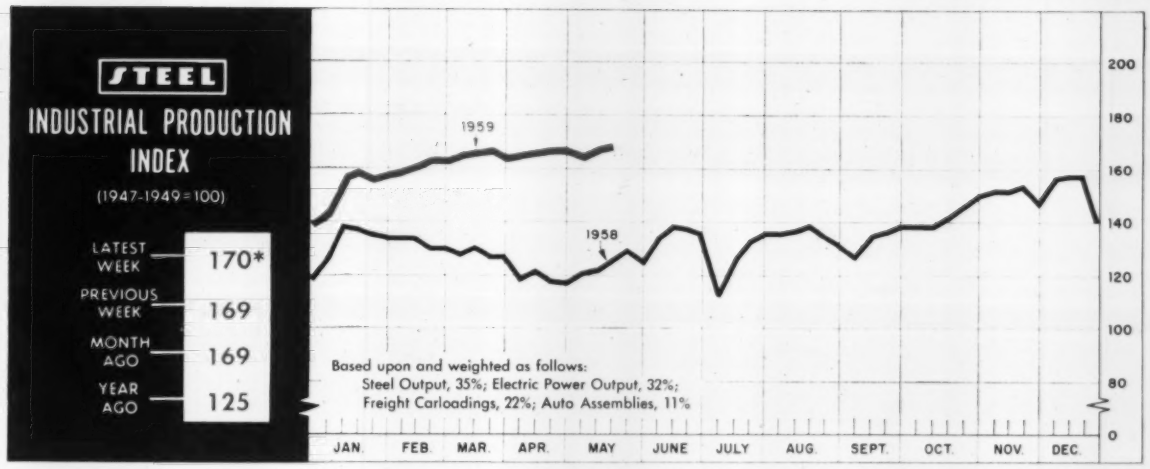
TIMKEN GRAPHITIC STEELS ARE CARRIED IN STOCK BY 9 DISTRIBUTORS WITH 42 WAREHOUSES IN 31 CITIES IN THE UNITED STATES AND CANADA



*Week ended May 16.

Capital Goods Reinforce Upturn

CAPITAL GOODS, a new favorite in the recovery sweepstakes, finally broke away from the post and is expected to make this a faster race than most observers had expected. The front runners—autos, construction, steel, and appliances—are still setting a fast pace, but the smart money is on the late starter to make a new race out of it.

By now there is no question that the recovery portion of the economic upturn is a thing of the past. We already are in new territory as far as nondurable and many consumer durable goods industries are concerned. STEEL's industrial production index above has indicated this since late in the first quarter. Now the Federal Reserve Board's production index confirms it. Rising 2 points above the record set only a month before, the index stood at 149 (1947-49 = 100) in April (see table and graph, Page 112).

• **Capital Fillip**—This third consecutive 2 point rise in the FRB index came at a time when many economists felt the economy was beginning to lag. Forces mainly responsible for the initial upsweep were leveling off. The big difference in April: The sudden, almost dramatic revitalization of capital goods industries, spurred probably by the near-record showing of first quarter profits.

Here is what the records show for a few of those industries:

• **Industrial Furnaces**—New orders worth $13,328,000 made April the biggest month since February, 1956, reports the Industrial Heating Equipment Association Inc. Along with a moderately good March, the bulge in business lifted the first four months of this year 95 per cent above the corresponding period of 1958. Cumulative orders for induction heating equipment through April are 129 per cent above the year-ago total. (See Page 91.)

• **Material Handling**—Bookings for

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,674[1]	2,631	1,523
Electric Power Distributed (million kw-hr)	12,650[1]	12,659	11,257
Bituminous Coal Output (1,000 tons)	8,415[1]	8,275	6,250
Crude Oil Production (daily avg—1,000 bbl)	7,150[1]	7,200	6,262
Construction Volume (*ENR*—millions)	$415.6	$403.3	$435.4
Auto, Truck Output, U. S., Canada (*Ward's*)	172,325[1]	170,993	113,998
TRADE			
Freight Carloadings (1,000 Cars)	685[1]	677	561
Business Failures (Dun & Bradstreet)	265	275	279
Currency in Circulation (millions)[3]	$31,505	$31,369	$30,810
Dept. Store Sales (changes from year ago)[3]	+14%	+6%	−4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,026	$26,179	$21,570
Federal Gross Debt (billions)	$287.1	$285.2	$274.9
Bond Volume, NYSE (millions)	$30.0	$31.9	$22.6
Stocks Sales, NYSE (thousands of shares)	18,115	18,994	13,308
Loans and Investments (billions)[4]	$94.3	$94.7	$92.0
U. S. Govt. Obligations Held (billions)[4]	$28.9	$29.3	$30.5
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	222.4	222.1	195.5
All Commodities[7]	119.6	119.6	119.5
Commodities Other than Farm & Foods[7]	127.9	127.9	125.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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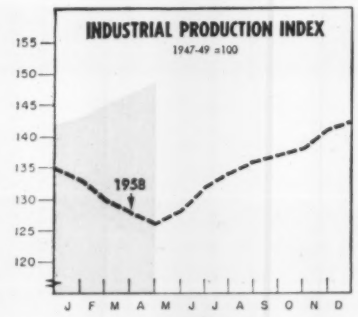
THE BUSINESS TREND



(Seasonally adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1959	1958	1959	1958	1959	1958
Jan.	143	133	125	100	166	159
Feb.	145	130	138	95	168	153
Mar.	147	128	146	91	170	150
Apr.	149*	126	152*	86	172*	146
May	...	128	...	91	...	148
June	...	132	...	103	...	151
July	...	134	...	102	...	154
Aug.	...	136	...	109	...	156
Sept.	...	137	...	113	...	155
Oct.	...	138	...	123	...	155
Nov.	...	141	...	123	...	163
Dec.	...	142	...	123	...	165
Avg	...	134	...	105	...	155

Federal Reserve Board. *Preliminary.

	1959	1958	1957	1956
Jan.	115.84	93.07	126.34	122.43
Feb.	124.77	93.49	139.29	129.56
Mar.	146.36	97.89	140.76	166.14
Apr.	.....	122.36	132.67	145.20
May	.....	118.04	157.95	155.53
June	.....	131.15	121.57	189.13
July	.....	134.34	128.31	165.50
Aug.	.....	104.46	110.09	168.70
Sept.	.....	85.41	116.79	130.35
Oct.	.....	111.35	124.80	143.38
Nov.	.....	110.88	87.80	138.50
Dec.	.....	105.97	105.65	117.76
Avg	.....	109.87	124.34	147.68

Material Handling Institute Inc.

Charts copyright, 1959, STEEL.

this equipment reached the highest level in 23 months, declares the Material Handling Institute Inc. The new order index for March hit 146.36 (1954=100), marking the third monthly rise in succession (see graph, above). Dollar volume of new orders in the first quarter of 1959 is nearly 30 per cent of the total new business for all of last year.

• **Foundry Equipment**—This industry has pulled one of the biggest surprises of the economic comeback. After setting a nine year high of 237.1 (1947-49=100) in February, the March index of new orders reported by Foundry Equipment Manufacturers Association was an impressive 166.6 (1947-49 = 100). With the exception of the record, this level had not been reached since August, 1957. The monthly average in the first quarter is 177, higher than the annual average for any year since the current benchmark was established in 1953.

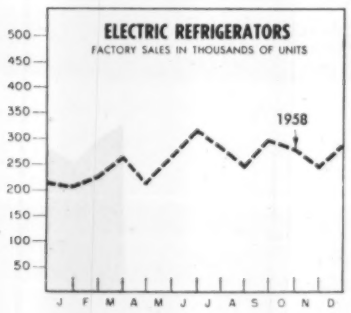
• **Industrial Supplies** — Between February and March, the seasonally adjusted index of the American Supply & Machinery Manufacturers' Association Inc. experienced the steepest rise since the recession's low point was reached. It bounded to 221 (July, 1948=100), equaling the the all-time high set in January, 1957.

• **Trucks** — Output of trucks by American makers has hit the 27,000 unit mark two weeks running, marking the first time that figure has been reached since early December, 1956. At the current rate, output for 1959 could be 1.2 million units, the highest since 1955, says *Ward's Automotive Reports*. In fact, production for the first five months of 1959 is slightly ahead of the corresponding period in 1955.

The influence of those revitalized capital goods industries can be seen in April's employment figures. The net gain of production workers in all manufacturing plants was 16,000. But the gain in durable goods industries was 56,000, completely wiping out the losses in nondurable goods factories.

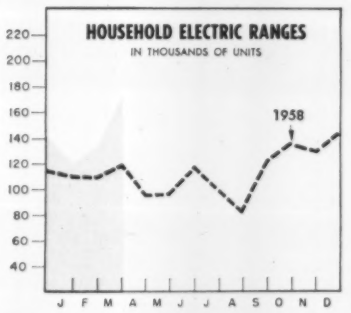
GNP Sets Another Record

This strengthening of the capital goods sector of the economy was at least partially responsible for pushing the gross national product to another record in the first quarter. Pegged originally at an annual



	1959	1958	1957
Jan.	256,200	206,100	305,400
Feb.	306,200	227,800	298,700
Mar.	333,700	261,100	309,300
Apr.	.....	210,800	281,600
May	.....	262,900	303,700
June	.....	316,300	305,100
July	.....	279,700	318,000
Aug.	.....	245,900	240,500
Sept.	.....	295,800	265,200
Oct.	.....	277,900	261,500
Nov.	.....	245,500	246,400
Dec.	.....	286,900	214,600
Totals	.....	3,116,700	3,350,000

National Electrical Mfrs. Assn.



	Total Factory Sales—Units		
	1959	1958	1957
Jan.	120,800	109,000	144,500
Feb.	134,600	108,700	127,700
Mar.	172,600	117,900	139,400
Apr.	.....	95,600	107,200
May	.....	96,000	93,600
June	.....	116,800	102,300
July	.....	98,500	88,700
Aug.	.....	81,400	85,800
Sept.	.....	121,800	124,800
Oct.	.....	135,500	120,400
Nov.	.....	129,000	116,800
Dec.	.....	143,900	113,800
Totals	.....	1,354,100	1,365,000

National Electrical Mfrs. Assn.

rate of $465 billion, the government revised the figure to $467 billion. Manufacturers, faced with a possible steel strike at a time when orders for their goods were rising faster than expected, increased their inventory buying, mostly of steel. The buildup had been estimated at an annual rate of $4 billion in the first quarter, but it turned out to be $5.7 billion.

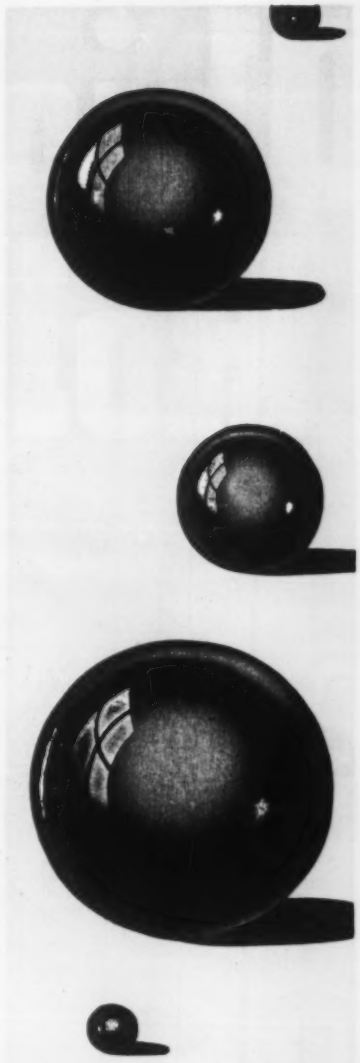
Inventory Well in Hand

James Dawson, vice president and economist for the National City Bank of Cleveland, suggests it might be worthwhile to keep an eye on the inventory level for a clue to future recessions. Even with the buildup in the first quarter, he claims the ratio of inventories to shipments is relatively low at 1.46. He points out that it was 1.60 in mid-1953 and again in mid-1957 before the economy began to soften. "As the ratio advances and once more approaches the 1.60 level, it should be considered a warning that chances of an economic setback are increasing. The warning should be considered particularly insistent if, at the same time, manufacturers' inventories are going up relative to orders and backlogs," he claims.

Index Nudges High Again

STEEL's industrial production index continues to inch its way up to record levels. After failing by 2 points to reach the preliminary reading of 171 (1947-49=100) for the week ended May 9, the index again made an effort to set a new mark by rising to a preliminary 170 for the following week. Once again it was the failure of the steel industry to meet its schedules which made the difference between preliminary and final readings. However, the industry will try again, scheduling operations at about 95.5 per cent of capacity, good for a little over 2.7 million net tons of steel for ingots and castings during the week ended May 24.

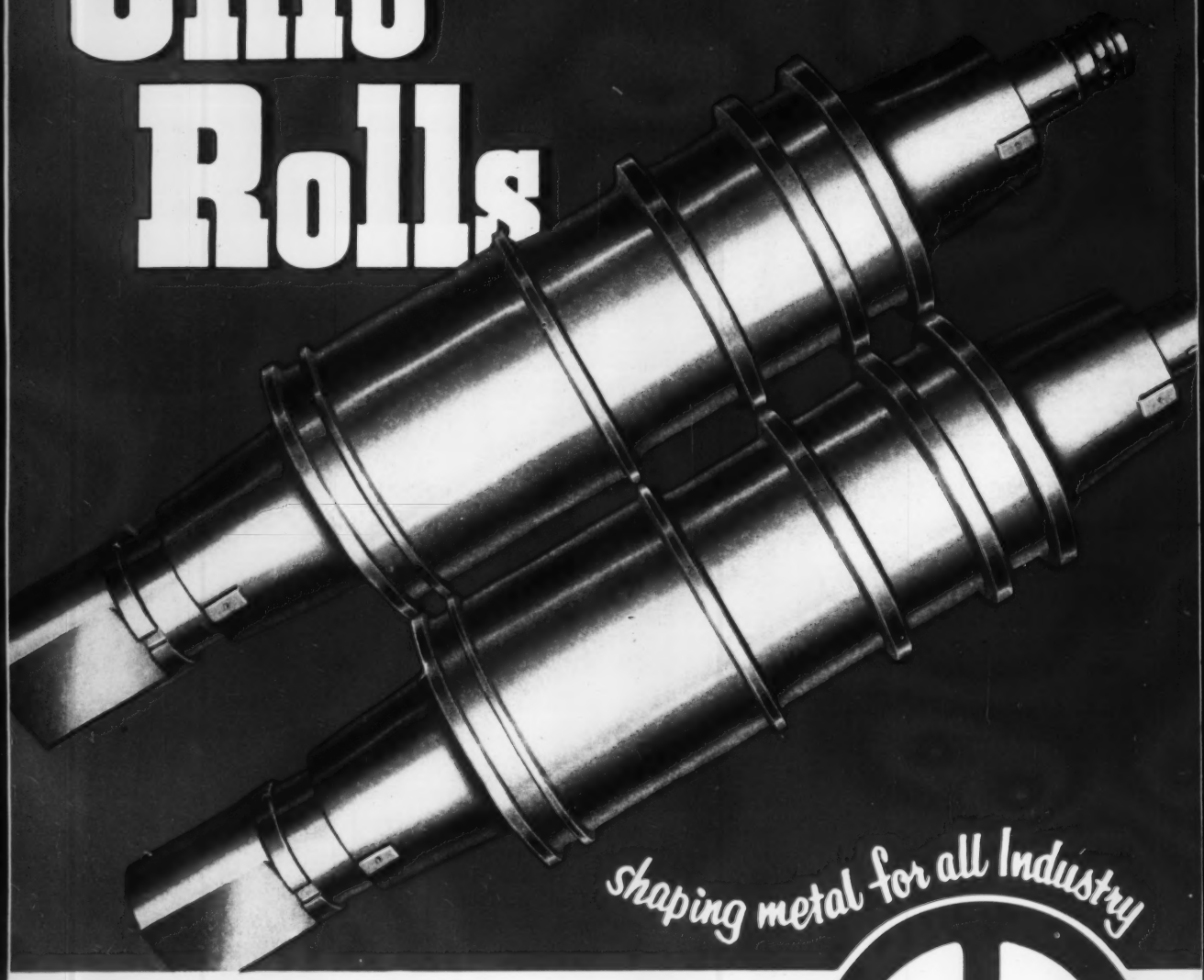
All other elements of the index showed minor improvement. Auto and truck output for the week ended May 16 beat the previous week by 200 units, setting a 1959 high of 162,443 units. Output of electric power is rising gradually above the 12.6 billion kw-hr mark, indicating that its seasonal slump is at an end. Railroad freight carloadings are now above the 680,000 mark and will continue to expand until the steel industry contract deadline of June 30.



COOLIDGE
Balls

COOLIDGE CORPORATION
MIDDLETOWN, OHIO

Ohio Rolls



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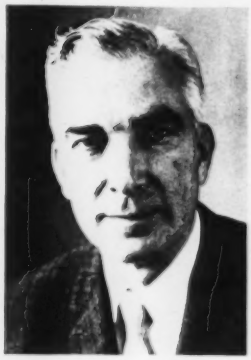


FRANK COOLBAUGH
Climax Molybdenum president

DONALD E. BEATON
Twin Disc Clutch post

Maurice F. Dufour was elected executive vice president, **Freeport Nickel Co.**, New York. He is also a vice president of the parent company, **Freeport Sulphur Co.**, and is in charge of construction of its nickel-cobalt project scheduled to be in production later this year. Here are the new officers of **Moa Bay Mining Co.**, Freeport Nickel subsidiary, which will operate the Cuban mine and concentrating plant: **Richard V. Colligan**, president; **Balfour F. Darnell**, vice president-general manager; **Robert L. James**, vice president-legal; **Rudolph E. Kruger**, vice president-finance; **Daniel W. Machon**, vice president-administrative.

Forrest H. Golden was made manager, Alloy Div., **Allied Steel Products Corp.**, Kenilworth, N. J. He was with Alloy Fabricators Div., Continental Copper & Steel Industries.

H. Robert Cameron was appointed vice president, **Pittsburgh Bridge & Iron Works**, Pittsburgh. He was consulting engineer.

George Konkol fills the new post of general manufacturing manager, Parts Div., Warren, Pa., **Sylvania Electric Products Inc.**, subsidiary of General Telephone & Electronics Corp. He was manufacturing manager-wire, weld and metal stampings operations.

Lawrence C. Felder was elected president, **Virginia Metal Products Inc.**, Orange, Va., subsidiary of Chesapeake Industries Inc. He succeeds **Fred I. Courtney**, resigned.

James R. Brown Jr. was made director of manufacturing, **Dresser Industries Inc.**, Dallas. He was with Baldwin - Lima - Hamilton Corp., most recently serving as works manager.

Frank Coolbaugh was appointed president, **Climax Molybdenum Co.**, New York, division of American Metal Climax Inc. He succeeds **Weston Thomas**, recently elected executive vice president of the parent company. Mr. Coolbaugh was vice president-western operations of Climax previous to its merger in 1957 with American Metal Co. Ltd. He then became a vice president of the merged company.

Jan Mueller was named manager of jet engine component manufacturing, **American Metal Products Co.**, Detroit.

J. E. Peterson was named sales manager-universal joints by **Dana Corp.**, Toledo, Ohio. He succeeds **W. H. Schomburg**, recently promoted to assistant general sales manager.

Ray Chaney was named vice president and director of sales, **Randall Graphite Bearings Inc.**, Lima, Ohio. He was sales manager.

Newton J. Friese Jr. was elected a vice president of **General Strapping Corp.**, New York. He continues as sales manager.

Russell Herig was elected vice president-sales, **Beaver Pipe Tools Inc.**, Warren, Ohio.

Donald E. Beaton was named director of manufacturing, **Twin Disc Clutch Co.**, Hydraulic Div., Rockford, Ill. He was assistant general manager of the division.

William J. Hamley was made production control supervisor of **A. M. Byers Co.'s** South Pittsburgh, Pa., plant. He formerly held a similar post at Alwac Computer Div., El-Tronics Inc., Hawthorne, Calif.

George D. Rice was named to the new post of vice president-manufacturing, **Humphrey Inc.**, San Diego, Calif.. He was vice president-manufacturing, Kin Tel Div., Cohu Electronics.

John P. Bennett was made manager of marketing research, a new post at **I-T-E Circuit Breaker Co.**, Philadelphia. He was manager of market planning at the BullDog Electric Products Div., Detroit.

John R. Crossgrove was made specialist-marketing research in **General Electric Co.'s** Foundry Dept., Schenectady, N. Y.

Murray Wachsman, director of manufacturing, was named vice president-manufacturing, **Lewyt Mfg. Corp.**, Long Island City, N. Y. **Sheldon Detwiler** was made vice president-research and development. **Harry Appelstein** was appointed vice president-treasurer.

P. C. Fourney was made assistant works manager, **Union Carbide Metals Co.**, division of Union Carbide Corp., New York. Mr. Fourney was manager of the Alloy

CLIFFORD SANDS

PHILLIP C. ALTHEN

Alcoa rigid containers posts

E. H. GOTT

OSCAR PEARSON

U. S. Steel administrative vice presidents-production

Works, and is succeeded by **John Winterhaler.**

Aluminum Co. of America, Pittsburgh, appointed **Clifford Sands** industry manager for rigid containers; **Phillip C. Althen,** technical manager, both newly created posts. Mr. Sands has been located at Alcoa's Cleveland district sales office. Mr. Althen was manager, packaging section, Sales Development Div. at New Kensington, Pa.

Boston Gear Works, Quincy, Mass., appointed **William J. Johnson** manager-field sales; **Edward P. Williams,** manager-internal sales.

C. Melvin Smith was made chief engineer, Stainless & Strip Div., Detroit, **Jones & Laughlin Steel Corp.**

Aristoloy Steel Div., Copperweld Steel Co., opened a district sales office in Pittsburgh, to be headed by **John O'Connor III.** In the division's Detroit office, **James D. McKinnon** was named district sales manager. **Max G. Manker** was made Chicago district sales manager; **Frank F. Gray,** New York district sales manager; **J. Robert Waters,** Philadelphia district sales manager.

Charles J. Betz was named outside sales manager of industrial fasteners, **Standard Pressed Steel Co.,** Jenkintown, Pa. He is replaced as inside sales manager by **Donald J. Morris.**

Walter J. Erdell was named district sales manager in charge of **Damascus Tube Co.'s** new Chicago district sales office. He joined Damascus in 1952, and has served as sales manager since 1955.

United States Steel Corp., Pittsburgh, appointed two administrative vice presidents in its production department. **E. H. Gott** heads central operations (steel and coal); **Oscar Pearson** heads steel producing divisions. Mr. Gott succeeds **Stephen M. Jenks,** recently made executive vice president-engineering and research. Mr. Pearson succeeds Mr. Gott. **E. B. Speer** succeeds Mr. Pearson as vice president-operations. **R. W. Graham,** former general superintendent, Homestead District Works, Munhall, Pa., replaces Mr. Speer as general manager, operations-steel.

Crane Co., Chicago, reappointed **George F. Burley** vice president-sales, and established four sales posts: **Clarence E. Watson,** general manager-atomic energy sales; **Darrell R. Nordwall,** general manager-branch sales; **Charles H. Lovelace,** general manager-engineering sales; **R. W. Lindsay,** general manager-wholesaler sales.

Stimmel Winch Co. Inc., Long Island City, N. Y., elected **Herbert Frie** vice president.

At **General Dynamics Corp.'s** General Atomic Div., San Diego, Calif., **Dr. E. C. Creutz** was appointed vice president-research. **H. B. Fry** and **C. A. Rolander Jr.** were named vice presidents. Mr. Fry continues as director of administration. Mr. Rolander's responsibilities will include the area of program development.

George Heard was elected president, **Safety First Supply Co.,** Pittsburgh. He was manager of Dravo Corp.'s Contract Dept. Mr. Heard succeeds **George S. Shull,** named chairman. **Davis E. Houston** was named vice president-general manager; **Philip A. Lascher,** vice president-sales.

Walter Hochschild was elected president, **American Metal Climax Inc.,** New York. He succeeds **Hans A. Vogelstein,** who resigned the presidency for reasons of health, and was elected chairman of the finance and investment committees. Mr. Hochschild retains his posts as vice chairman of the board, and chairman of the executive committee.

A. Donald Moll, assistant sales manager, **Minneapolis Electric Steel Castings Co.,** Minneapolis, will in addition become manager of technical services and sales of high alloy and stainless steel castings.

L. F. Heckmann was elected vice president-sales, **Union Metal Mfg. Co.,** Canton, Ohio. He was general sales manager.

E. C. Titcomb was made sales manager, **Kin Tel Div.,** San Diego, Calif., Cohu Electronics Inc. He succeeds **R. T. Silberman.**

William B. Bergen, former executive vice president, was elected president and principal operating officer of **Martin Co.,** Baltimore. **George M. Bunker** remains as chairman and chief executive.

Bruce L. Dwiggins was made production superintendent of **Michigan Chemical Corp.'s** new magnesium oxide plant in Port St. Joe, Fla.

A. T. Nielsen was appointed plant manager of **Cowles Chemical Co.'s** operations at Skaneateles Falls, N. Y. He was with Chas. Pfizer &

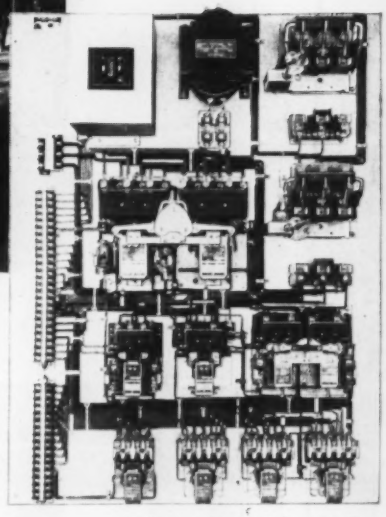
SQUARE D PRESS CONTROL

Built the Way You Want It!

Square D control is used by virtually every stamping press manufacturer in the country—and is approved by the three largest automobile manufacturers.

What's behind this preference for Square D? Biggest reason, we believe, is *completeness* of line which enables us to *custom build* to individual requirements, using *standard* control components. Actually, that has a bearing on a lot of things—including delivery, safety, uninterrupted production, maintenance parts standardization, plus field engineering service.

On the next press you buy, specify **SQUARE D CONTROL.**



above • **typical Square D press control panel, designed and built to customer specifications, using standard components**

NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE

SQUARE D COMPANY

SAMUEL R. PARRY
Combustion Eng. v.p.-mfg.

CHARLES R. MUENGER
Dollin production post

LARNED S. WHITNEY JR.
Stanley-Humason v.p.

DR. ITALO S. SERVI
Kelsey-Hayes metals research

JACK H. COX
Calco Div. manager

JOHN V. VANDEN BOSCHE
McGregor-Michigan chief eng.

Co.'s Groton, Conn., plant as manager in charge of production of chemicals and vitamins.

Dr. Italo S. Servi was made director of research, Metals Div., **Kelsey-Hayes Co.**, New Hartford, Conn. He was manager-research group at Union Carbide Metals Co.

Jack H. Cox was named manager, Calco Div., **Armco Drainage & Metal Products Inc.**, Middletown, Ohio. The division includes California and most of Nevada and Arizona. Headquarters is in Berkeley, Calif. He succeeds **L. W. Hanson**, retired. **John M. Robertson** succeeds Mr. Cox as manager of drainage and allied products sales. **Howard L. White** replaces Mr. Robertson as chief sales engineer.

F. H. Sherman was elected president and general manager, **Dominion Foundries & Steel Ltd.**, Hamilton, Ont. **A. G. Wright** was made vice chairman-finance; **F. A. Loosley**, vice chairman-research and development.

John V. Vanden Bosche was made chief engineer, **McGregor-Michigan Corp.**, Detroit. He has been superintendent of field services for the last eight years. **John Cullen**, former chief engineer, was promoted to Michigan sales manager. **Robert C. Hilprecht**, former sales manager, becomes outstate sales manager.

J. E. Williams was made corporate vice president-manufacturing services, **Olin Mathieson Chemical Corp.**, New York. He has served, since 1958, as corporate vice president and general manager of the Metals Div.

Richard S. Stevens was made manager of the new department of market development for **United States Chemical Milling Corp.**, Manhattan Beach, Calif.

William E. Carter was named Pittsburgh branch sales manager, **Exide Industrial Div.**, Electric Storage Battery Co. He succeeds **Robert L. Kegg**, resigned to establish his own business.

Samuel R. Parry, former vice president-general manager, Chattanooga Div., **Combustion Engineering Inc.**, New York, was appointed vice president-manufacturing for the entire company. **Harry J. Bolwell** was made general manager-Chattanooga Div.

Charles R. Muenger was appointed production plant manager, **Dollin Corp.**, Irvington, N. J. He was director-engineering and research at Schultz Die Casting Co., Toledo, Ohio.

Larned S. Whitney Jr. was appointed vice president-general manager, **Stanley-Humason Inc.**, Forestville, Conn., subsidiary of Stanley Works, New Britain, Conn. He was formerly co-ordinator of hand tool plants outside of New Britain.

General Motors Corp. consolidated its Fabricast Div. plants into the Central Foundry Div. **George A. Zink**, formerly general manager, Fabricast Div., continues as manager of Fabricast plants in Bedford and Jones Mills, Ark., and will also serve as manager of light metals programs for the expanded division. **Elmer E. Braun**, former works manager, Central Foundry Div., assumes the title of divisional manager-ferrous metals operations. **Carl A. Koerner**, former manufacturing manager, Central Foundry, was made director of sales and engineering for the expanded division. **Edgar A. Wondracheck**, former Fabricast manufacturing manager, was made plant manager of the Bedford, Ind., plant, with the Jones Mills plant reporting to him.

Conrad Kunze was appointed assistant to the executive vice president, **Convair Div.**, San Diego, Calif., General Dynamics Corp.

OBITUARIES...

James A. Lee, 57, director of procurement, Automotive Div., **American Motors Corp.**, Detroit, died May 9.

Charles Penhaligen, 57, auditor for **Dow Chemical Co.**, Midland, Mich., and a member of the finance committee, died May 8.

Whitley Collins, 61, president, **Northrop Aircraft Inc.**, Beverly Hills, Calif., died May 12.

NOW A NEW STANDARD OF
QUALITY FOR ROLLING
FOIL AND STAINLESS

MIDVAC

Micro Lustre

FINISHING ROLLS

FINER FINISHES...
LESS GRINDING...
LONGER LIFE

Now, Midvale-Heppenstall offers the finest precision ground rolls made from consumable electrode, vacuum arc melted Alloyed Steels with unsurpassed uniformity of fine grain structure, maximum freedom of defects and non-metallic inclusions. The results are rolls with a Micro-Lustre finish that assures rolling free of surface imperfections . . . can be ground as much as 30% quicker . . . give longer trouble-free service between grinds.

That is why Midvac Rolls are being used throughout the nation for rolling stainless steel, aluminum, foil, brass and precious metals. Midvac Micro-Lustre finish improves the finish of your product and saves grinding time. Midvale-Heppenstall also makes forged rolls of any size for any purpose required in the rolling of steel, aluminum, copper, brass, and other metals . . . as well as paper, plastics and rubber.

MidVac Rolls

MIDVALE-HEPPENSTALL CO., NICETOWN, PHILADELPHIA 40, PA.

Subsidiary of **HEPPENSTALL COMPANY**, Pittsburgh, Pa.

MH

Quality . . . the best economy of all

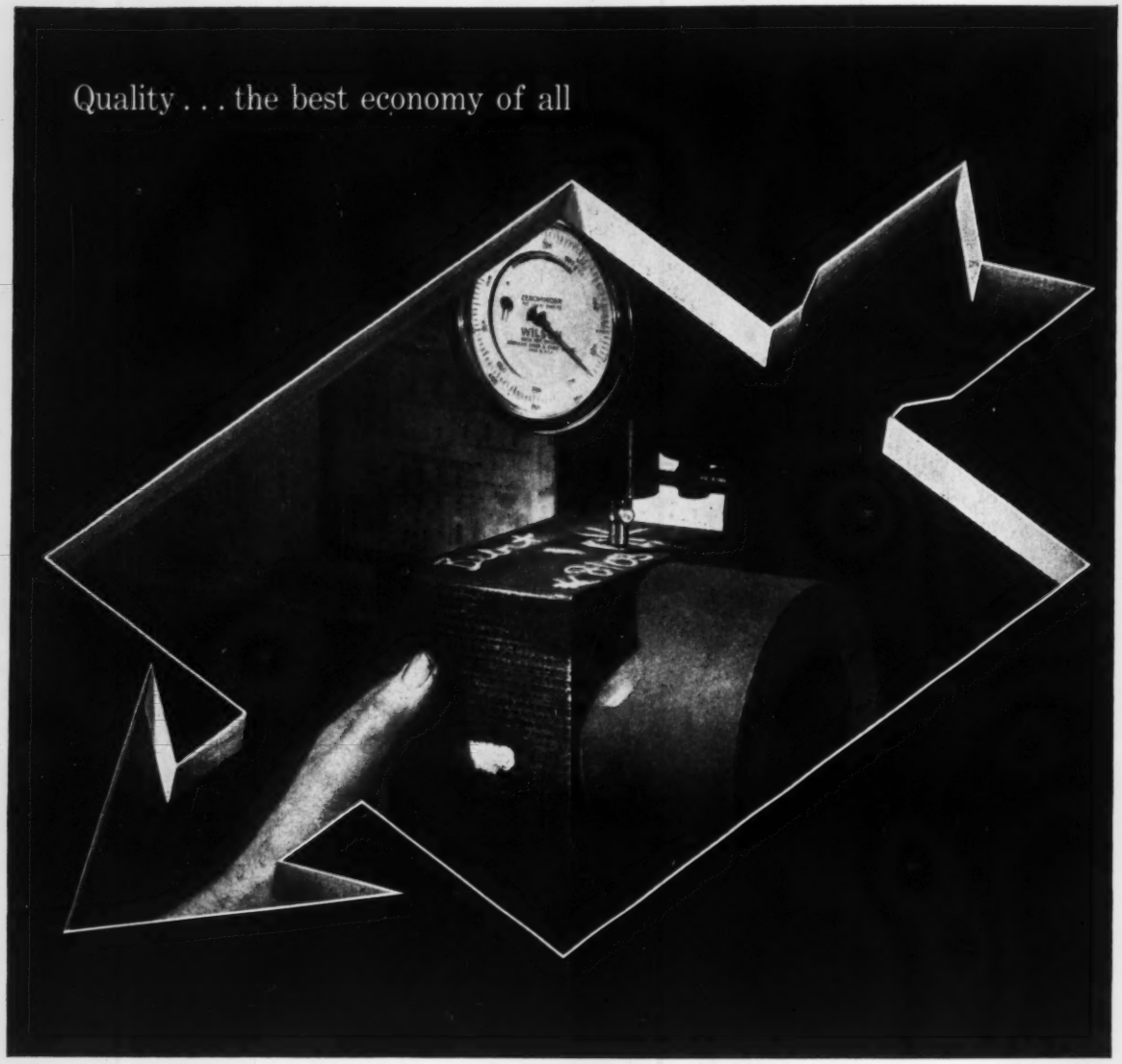


Photo courtesy of J. W. Rex Corp.

To hit the exact qualities you want . . . you need a choice of quenching oils

You can *get by* with just one quenching oil. But you can't always get the *best results* . . . not when you measure quality to a fine degree. Very often, you need a choice.

Sun makes quenching oils to reduce cooler-maintenance costs... oils with high antidecomposition qualities . . . oils for fast-quenching operations . . . oils for marquenching . . . and other "specials."

See your Sun representative for help in evaluating your quenching needs. He'll show you how to save money while maintaining quality . . . the best economy of all.

SUN OIL COMPANY
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SUNOCO®

MAKERS OF FAMOUS CUSTOM-BLENDED BLUE SUNOCO GASOLINES

Hot-Strip Mill Kicks Off Record Republic Expansion

REPUBLIC STEEL CORP. has announced a $375 million capital improvement program, largest in the company's history. The expenditure is to be spread over a four year period. The first major project will be a new, 56 in., hot strip mill at its Warren, Ohio, works. Monthly capacity: 145,000 tons. Cost: $45 million.

Construction is scheduled to start as soon as possible, with operations beginning in the latter part of 1960. The present 42 in. mill (monthly capacity: 85,000 tons) will continue production until that time. It will then be dismantled and its area used for additional finishing facilities.

• **Versatile**—The new mill can produce numerous types of sheets, including special grades of stainless being developed for aircraft and missiles, as well as carbon steel sheets and strip, reports T. F. Patton, president. The mill will perform most of Republic's hot rolling of stainless steel. Exceptions: Sheets over 48 in. will continue to be rolled on the 98 in. mill at Cleveland. The mill will also turn out silicon sheets used in electrical equipment and can roll sheets from low alloy steels and titanium.

Components: Heating furnaces, a scale breaker, a reversing roughing stand, six finishing stands, a runout table, and two coilers. The operation is equipped to run at high speeds, with steel leaving the last finishing stand as fast as 2300 ft per minute.

A new building with over 300,000 sq ft of floor space is to be erected to house the mill.

Details of other projects in the program have not been released.

Pacific Mill Expands

Bethlehem Pacific Coast Steel Corp. has completed a $25 million expansion and modernization of its Seattle plant. The program was begun in December, 1956. New production facilities include: Two electric arc steelmaking furnaces which will boost the plant's annual capacity to 420,000 ingot tons; eight soaking pits; a 32 in. blooming mill; a 12 in. bar mill.

The only major installation remaining from the pre-1957 plant is a 22 in. rolling mill which has been modernized. A new, 3 high mill for rolling plates up to 30 in. wide will be installed this fall.

Ford To Modernize Plant

Ford Motor Co. will spend over $1.4 million for equipment, modernization, and long range improvement of its Buffalo stamping plant during 1959.

Structural Capacity Upped

Bethlehem Fabricators Inc., Bethlehem, Pa., has completed a $750,000 plant expansion program, boosting its annual structural steel capacity from 35,000 to 50,000 tons. Features include: A self-contained "rush job" fabricating shop; a new girder fabricating shop (bridge girders up to 150 ft long can be produced); mobile, high speed machine tools which reduce work movement.

THESE TELESCOPIC STEEL FORMS (diameter: 17½ ft) and mechanized traveler will be used in the construction of a 1 ft thick concrete lining for an 11 mile water pressure tunnel in Reading, Calif. A shop setup by Blaw-Knox Co. in Pittsburgh insures perfect on-the-job workability of the units

Tyson Expands Again

Tyson Bearing Co., Massillon, Ohio, has started its second, $1 million expansion project. It will be completed by September, doubling the plant's manufacturing area. The first phase of another $1.2 million program was completed last month. Tyson is a division of SKF Industries Inc., Philadelphia.

Linde to Build Plant

Linde Co., a division of Union Carbide Corp., New York, will build a liquid hydrogen plant at Torrance, Calif. Construction will begin late this year. The move was prompted when the National Aeronautics & Space Administration awarded its liquid hydrogen contract to Linde. Annual plant capacity: 3.3 million lb.

Fansteel Plans New Plant

Fansteel Metallurgical Corp., North Chicago, Ill., will build a rectifier plant, adding 20,000 sq ft to its facilities. Capacity: 30,000 silicon power rectifiers per day. Target date for completion: Jan. 1, 1960.

Smith-Erie Adds Line

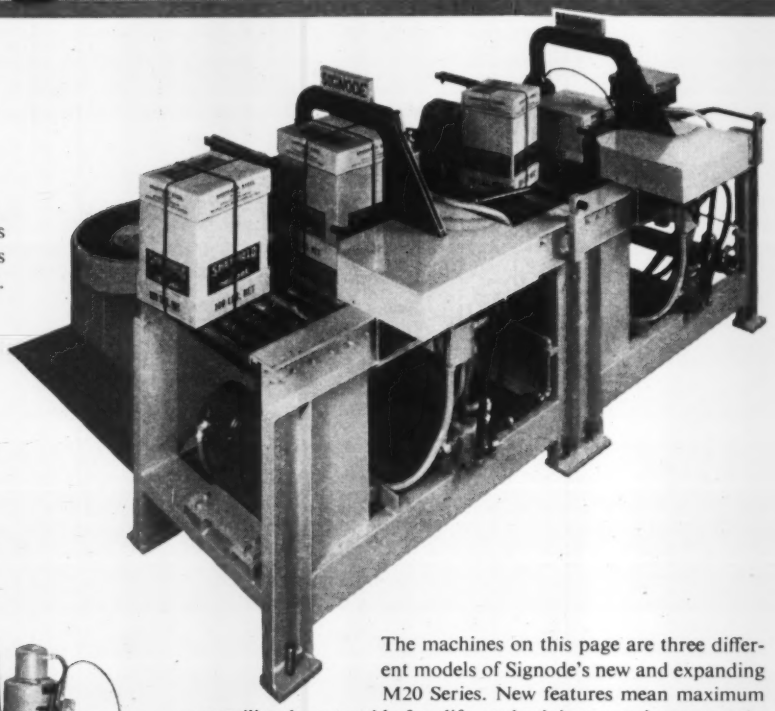
Smith-Erie Div., A. O. Smith Corp., Milwaukee, has purchased the micron fuel filter business of Burks Co., Detroit. All machinery, tools, and inventory of the business will be moved to the Smith-Erie facilities at Erie, Pa., from the Burks plant at Lapeer, Mich.

Kaiser Builds Plant

Kaiser Aluminum & Chemical Corp., Oakland, Calif., will build a plant at Midland, Mich., to expand its refractory magnesia operations. Chief product: High purity periclase for use in basic

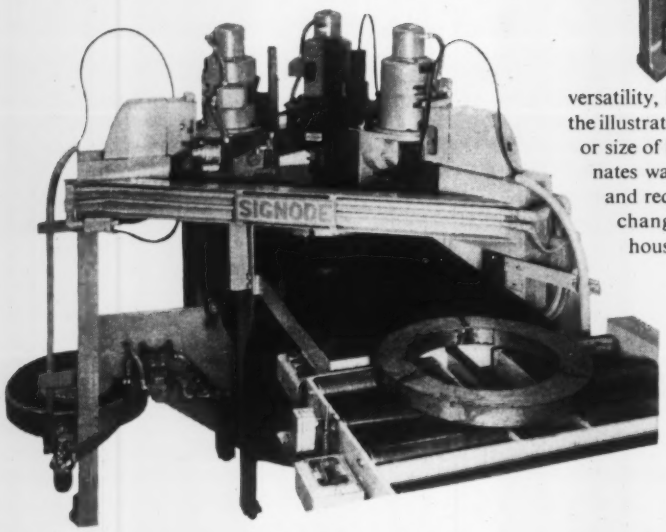
(*Please turn to Page* 124)

Signode machines



Operatorless
cross-strapping of nail cartons
in mixed sizes.

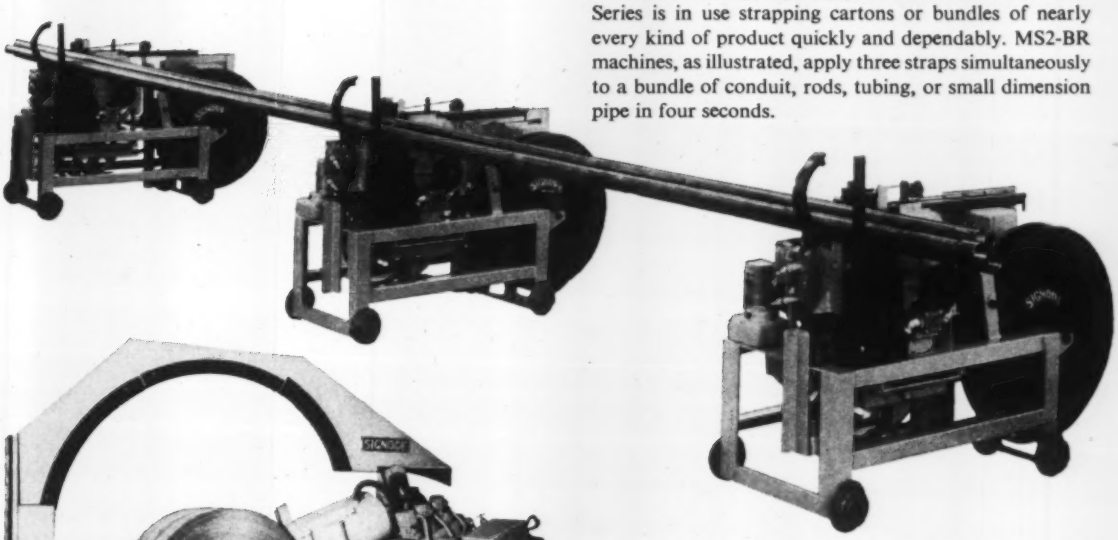
Operatorless strapping of strip
steel coils, 3 straps simultaneously,
up to 1,000 coils per hour.



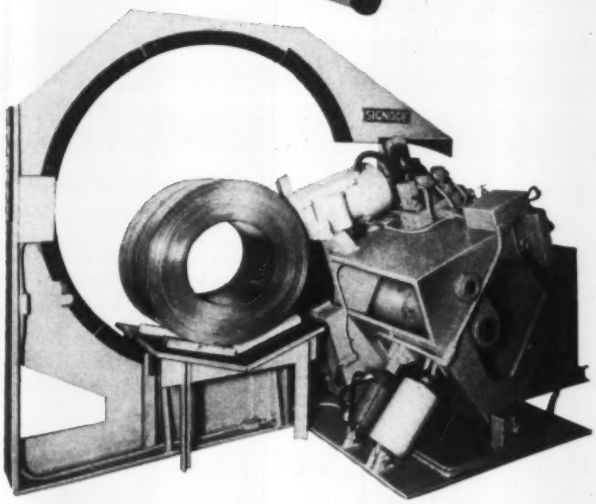
The machines on this page are three different models of Signode's new and expanding M20 Series. New features mean maximum versatility, long trouble-free life, and minimum maintenance. As the illustrations show, automatic strapping of practically any shape or size of bundle or container is possible. Overlap control eliminates waste of strap. Tension is easily and accurately pre-set, and requires no further adjustment unless type of package is changed. Vital working parts are protected by a sealed housing and run in a bath of oil. With an M20, strapping can be applied vertically or horizontally...any type of Signode PSM grade strapping can be used, in sizes from ⅜" to ¼". Seals can be lithographed with your trademark in color. Operation can be completely automatic (operatorless), or semi-automatic (push-button controlled).

Operatorless strapping
of plastic sheet packs.
Number of straps
per pack is optional.

reduce packaging costs



Push-button strapping of pipe. This "work horse" M2 Series is in use strapping cartons or bundles of nearly every kind of product quickly and dependably. MS2-BR machines, as illustrated, apply three straps simultaneously to a bundle of conduit, rods, tubing, or small dimension pipe in four seconds.



Operatorless circumferential strapping of aluminum coils. Strapping is automatically centered on coils from 30" to 72" O.D. Capacity is 300 to 400 coils per hour. Other MH Series machines put 300 to 360 straps per hour on hot or cold strip steel coils or rod or wire coils...have been proved dependable in as much as ten years of the hardest kind of steel mill service.

Every day hundreds of plants prove their economy and dependability

Signode machines strap faster and at less cost—and do it dependably, with uniform tension on every strap. Tensionable steel strapping is low in cost to begin with...and high in strength to ship with. Signode has unparalleled experience in building and applying over 30 different types of these machines. Improved flow, less waste, better handling, safer transit, and lower costs nearly always result. Signode Service includes operator training and fast mechanical service on a local basis, nationwide. All of these machines are available on either an annual rental or single payment basis. It will pay you to talk to the Signode man near you, or write:

First in steel strapping

SIGNODE STEEL STRAPPING CO.

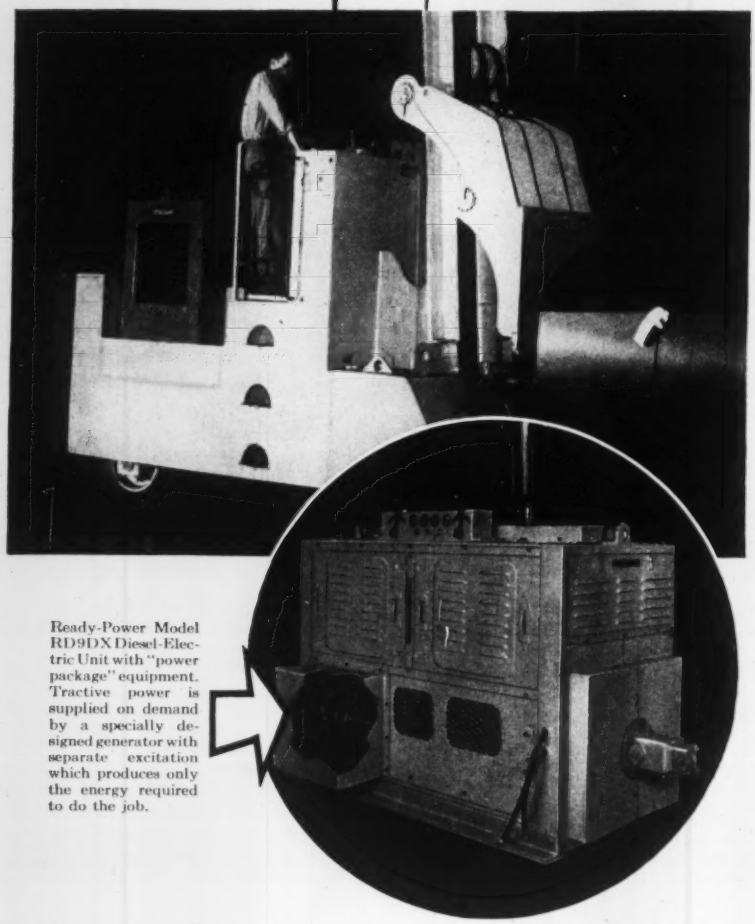
2645 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

New Diesel-Electric "Power-Package" Does Both Jobs Economically

1 GENERATES TRUCK MOTIVE POWER

2 DIRECT-DRIVES HYDRAULIC PUMP



Ready-Power Model RD9DX Diesel-Electric Unit with "power package" equipment. Tractive power is supplied on demand by a specially designed generator with separate excitation which produces only the energy required to do the job.

Ready-Power makes diesel-electric power doubly effective with a newly developed "power package" designed specifically for use with its "RD" Series Power Units. This remarkable new concept allows the unit to operate at *constant speed*, no load to full load, yet supplies full range of tractive power on demand and produces continuous hydraulic power without need for intermediate electric motors. The last word in simplicity, this new "power package" eliminates contactor failure, minimizes maintenance, assures maximum operating economy for electric trucks up to 200,000 lb. capacities. Write for complete information.

SEE READY-POWER ON DISPLAY AT THE MATERIAL HANDLING EXPOSITION, JUNE 9-12, BOOTH 1134

READY-POWER

The READY-POWER Co., 3824 GRAND RIVER AVE., DETROIT 8, MICH.

(*Continued from Page* 121)

refractories. Initial annual capacity: 45,000 tons of periclase.

Construction is scheduled to begin within two months. Cost: $3 million.

The facilities will provide raw material to Kaiser's Columbiana, Ohio, basic refractories plant which is being expanded for the second time to meet increased market demands in the East and Midwest.

Forms Pump Division

Owatonna Tool Co., Owatonna, Minn., has formed a division to manufacture hydraulic pumping units and handle the hydraulic segment of the regular OTC tool and maintenance equipment line.

Will Build Periclase Plant

E. J. Lavino & Co., Philadelphia, plans to build a plant at Freeport, Tex., to produce high grade magnesite (periclase), a component for the firm's refractory products. Dow Chemical Co. will supply magnesium hydroxide from regular production at its Freeport plant. The periclase will be shipped to Lavino's refractories plant at Plymouth Meeting, Pa., and to a refractories plant which will be built in the Chicago area. Lavino expects to spend about $3 million on the Freeport plant and will spend considerably more on planned step-by-step enlargements.

Clevite to Build Plant

Clevite Corp., Cleveland, will build a $3 million transistor and diode manufacturing plant at Waltham, Mass. It will contain about 125,000 sq ft of space and is scheduled for operation early next year.

Acme to Use L-D Process

Kaiser Engineers, a division of Henry J. Kaiser Co., Oakland, Calif., has licensed Acme Steel Co., Chicago, to utilize the L-D process patent rights for the production of steel in Acme's newly completed facilities at Riverdale, Ill. The $32 million semi-integrated plant includes two hot blast cupolas; two

Revere helped "fit the metal to the job"

. . . AIDING JOHN DEERE IN DESIGNING ITS FIRST GRAIN DRYER

The greatest bugaboo the farmer has to contend with in harvesting grain is the weather. If it is bad and the grain passes its peak of yield he loses time and money. The new JOHN DEERE 458 Grain Dryer makes it possible for the farmer to harvest when his grain reaches peak yield.

The Dryer was designed from the ground up to be superior in every respect yet competitive in price. In order to assure even feeding of the grain from the start, two metering rolls at the base of the machine are used (Cutaway above shows position of rolls in machine while large illustration is section of the Revere Welded Steel Tubing used for the 44¼″ long rolls).

In designing this Dryer JOHN DEERE Engineers considered various kinds of materials, finally specifying Revere Welded Steel Tubing, cold rolled 4½″ OD x .065″ wall, in the special grooved shape you see above, as being the best material available. Although difficult to fabricate, by most mills, Revere encountered no problems because of its vast experience in producing welded steel tubing in various shapes, sizes and gauges . . . from ¼″ to 5″ OD round, with walls from .028″ to .250″ depending on the size.

In fact it was the availability of the tube, plus the experience of making it in large sizes that decided DEERE Engineers to specify Revere. Performance of the tube, JOHN DEERE tells us, has been highly satisfactory.

What are *your* steel tubing needs? More than likely Revere can help you too. It costs nothing to inquire.

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

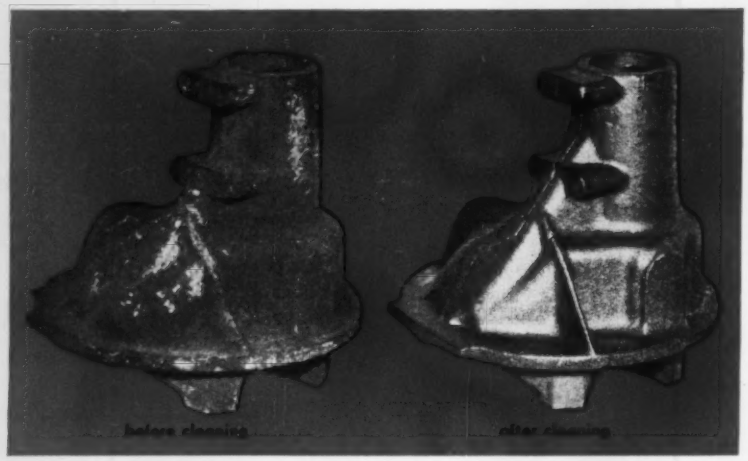
Rome Manufacturing Company Division

Box 111, Rome, N. Y.

WHEELABRATOR® STEEL SHOT

cuts abrasive costs for

ALL TYPES OF FOUNDRIES



Malleable Foundry Saves $12,000 Annually

Cuts Abrasive Consumption in half

Savings of $1,000.00 a month in abrasive cost are being made at Albion Malleable Iron Co., as a result of switching from a malleable type abrasive to Wheelabrator Steel Shot.

This foundry operates a battery of 8 Wheelabrator Tumblasts, cleaning a variety of regular and pearlitic malleable castings. Consumption of the malleable shot in these machines was at the rate of 20 tons a month. Since changing to Wheelabrator Steel Shot this has been decreased to 10 tons a month, for an annual saving of $12,000.00 on abrasive alone.

More than 1200 firms have standardized on Wheelabrator Steel Shot and are recording impressive savings. Consistently harder, with greater resistance to breakdown, it lasts longer in use, cleans better, and reduces total cleaning costs.

Write today for Bulletin 89-B — free — for detailed information on Wheelabrator Steel Shot

WHEELABRATOR
CORPORATION

509 South Byrkit Street **Mishawaka, Indiana**
Canadian Offices: Scarborough (Toronto) — Montreal

50-ton L-D furnaces capable of producing up to 600,000 ingot tons of steel annually; soaking pits; blooming, slab, and billet mills; an air pollution control system; and other appurtenant specialty steelmaking facilities.

Starts Oxygen Plant Work

Air Reduction Pacific Co., San Francisco, a division of Air Reduction Co. Inc., New York, has broken ground for a $3 million plant in Richmond, Calif. It will produce liquid oxygen, nitrogen, and argon.

Bridge Erection Starts

Bethlehem Steel Co., Bethlehem, Pa., has set the first steel for the $90 million Throggs Neck bridge, connecting Bronx and Queens, N. Y. The bridge will have a length, including approaches, of 12,310 ft.

Dow Forms New Group

Magnesium Products Sales Dept., Dow Chemical Co., Midland, Mich., formed an electrochemical and chemical sales group. Robert L. Featherly is manager of the group which will be responsible for sales of magnesium products for various nonstructural applications. They include extruded anodes for water heaters and other cathodic protection applications; and extrusions and strip for magnesium batteries.

Klaas Machine to Move

Klaas Machine & Mfg. Co. is erecting a 20,000 sq ft plant on Schaaf Road near the cloverleaf intersection of Routes 17 and 21, south of Cleveland. The company will continue the same services of contract manufacturing, custom welding, machine shop work, special machinery, conveying equipment, and the EMCO power press.

Buys Verona, Pa., Plant

Specialty Steel Products Inc., East Pittsburgh, Pa., purchased the Verona, Pa., plant of American Steel Foundries, Chicago, and will

when the pressure is on you need PEN-O-LED® EP

When production is up, a breakdown can be dangerously costly. Maintenance costs compounded with lost orders add up big in the profit squeeze. That's why in important places—such as gear drives subject to high pressures—you need Pen-O-Led EP, for protection against wear and costly down-time.

Pen-O-Led lubricants' extreme pressure and oiliness additives give you positive protection against friction and film rupture under the highest load conditions. They provide an ample margin of protection under shock loads, periods of peak overloads, and help prevent welding of gear teeth. Pen-O-Led EP is available in eight job-matched viscosity grades for gears, plain and anti-friction bearings, speed reducers, worm gears, screwdowns . . . wherever working loads exceed 1000 lbs. per lineal inch of gear tooth face.

For longer service life and lower maintenance costs — specify Pen-O-Led EP. For more information, call your nearest Esso office, or write: Industrial Lubricants Division, Esso Standard Oil Company, 15 West 51st Street, New York 19, New York.

Esso

In industry after industry..."ESSO RESEARCH works wonders with oil"

SHAFTEX speed reducer combines flexibility and dependability

Output speeds from 10 to 400 rpm, horsepower ratings from ½ to 40 — that's the scope of Allis-Chalmers line of *Shaftex* speed reducers, the last word in shaft-mounted power transmission drives.

Shaftex reducers couple flexibility with dependability. You may specify single or double reduction; you have a choice of tie rod or flange mountings.

You get these features for dependability:

Hardened gears are of single helical construction and rated to AGMA standards.

Reversible shaft features hollow-through low-speed shaft open at both ends for reverse assembly . . . can be mounted easily on driven shaft.

Positive oil seals keep oil in, dirt out.

Cast-iron housing assures precise alignment of components.

Splash lubrication provides continuous spray of oil to all moving parts.

Optional features available include overload releases and backstops. *For full details, contact your A-C representative or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wis.*

Shaftex and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-5982-G1

Built-in flexibility. Use the *Shaftex* reducer with flanges or tie rod . . . mounted angularly, vertically or horizontally. Locate motor where you want it. For speed variation, merely change the sheave size or use *Vari-Pitch* sheaves.

Simple belt tensioning. No need to adjust a motor base. Split-second tensioning is accomplished by a tie rod turnbuckle. This same device allows for fast belt change when required.

take possession of the property June 1.

Firms Change Names

Cycleweld Chemical Products Div. is the new name of Cycleweld Cement Products Div., Chrysler Corp., Trenton, Mich. Sumner B. Twiss has been appointed president.

Raytheon Co. is the new name of Raytheon Mfg. Co., Waltham, Mass.

Hamilton Foundry & Machine Co., Hamilton, Ohio, has become **Hamilton Foundry Inc.** Work is beginning on a $150,000 office addition and modernization program.

Stovkis Multiton Corp. is the new title of Stovkis-Edera Inc., Port Washington, N. Y.

Mid-Century Instrumatic Corp., New York, is now **Computer Systems Inc.**

NEW OFFICES

A new branch office and warehouse was opened by **Besly-Welles Corp.**, South Beloit, Ill., at 3224 Union Pacific Ave., Los Angeles 23, Calif.

Consolidated Systems Corp., newly formed subsidiary of Consolidated Electrodynamics Corp., Pasadena, Calif., has established regional offices in Washington, Atlanta, and Monrovia, Calif.

NEW ADDRESSES

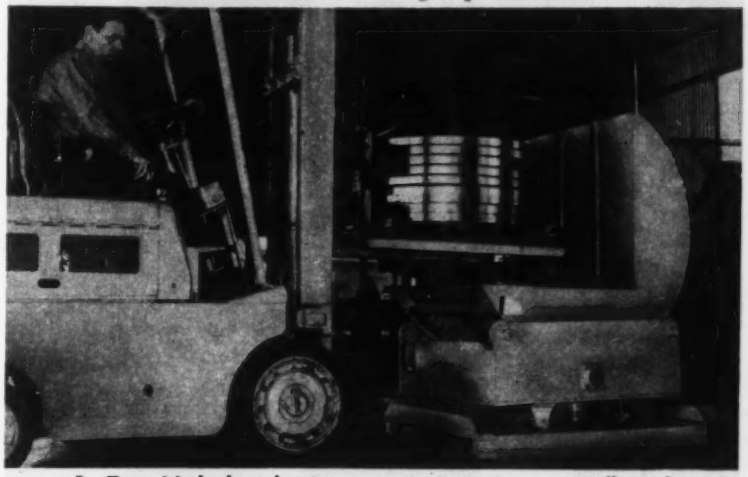
Eastern Stainless Steel Corp. moved its district sales office to 20800 Center Ridge Rd., Cleveland 16, Ohio.

Century Electric Co., moved its district office to 6835 W. Higgins Rd., Chicago 31, Ill.

B. C. Ames Co. moved its district office to 668 Pallister Ave., De-

(*Please turn to Page* 132)

Old Method – time consuming, requires two men



La Deau Method – takes just one man, is six times more efficient!

NEW TURNOVER CRADLES PALLETIZE COILS WEIGHING TO 40,000 LBS. IN SECONDS

Producers or users of coiled materials can now palletize coils weighing from 3000 to 40,000 pounds in 14-40 seconds with the completely automatic La Deau TURNOVER CRADLE. You save up to 400% in storage efficiency, 600% in labor efficiency, and eliminate elongated coils and dangerous band breakage. If you handle *only a carload of coiled materials per month*, you can pay for a TURNOVER CRADLE in about a year, with labor savings alone. Reason: the fully portable Cradle lets one man handle as much material in one hour as two men usually handle in three hours!

FORK TRUCK SETS COILS AND PALLET ON EDGE

CRADLE TIPS BACK, BASE REVOLVES, FRONT TO BACK

CRADLE ENDS 90° ROLL OVER, BASE COMPLETES 180° TURN

PALLETIZED COILS ARE READY TO FORK

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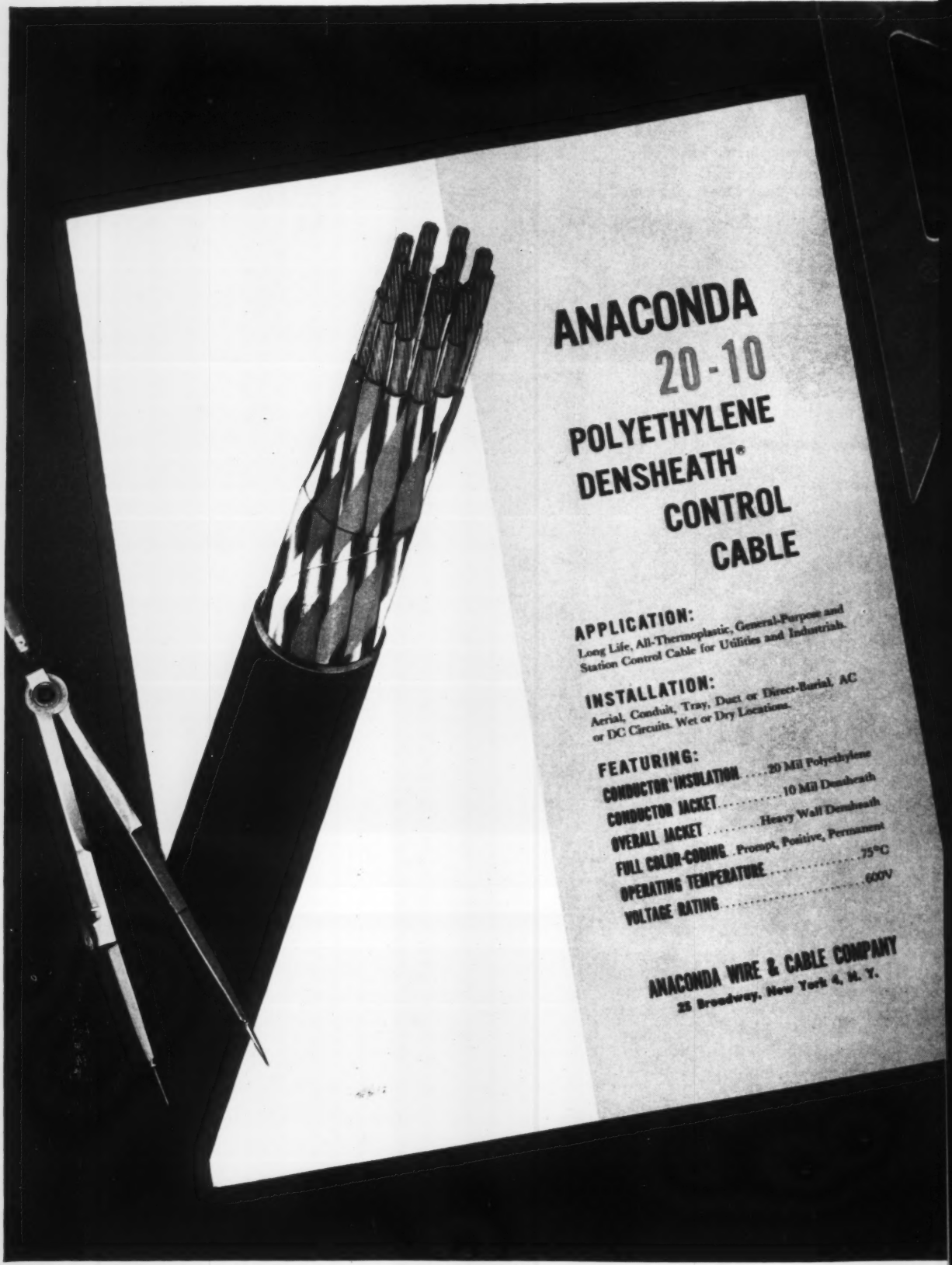
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POLYETHYLENE
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Long Life, All-Thermoplastic, General-Purpose and Station Control Cable for Utilities and Industrials.
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ANACONDA OFFERS ONE CONTROL CABLE FOR PRACTICALLY ALL 600-VOLT APPLICATIONS: ANACONDA THERMOPLASTIC 20-10 CONTROL CABLE!

Polyethylene—Densheath* (PVC) construction provides superior features, makes possible new economies and improved service through standardization.

Anaconda—after testing a wide range of designs — recommends 20-10 Control Cable as today's superior all-purpose thermoplastic cable for 600-volt service. Here is a standard control cable for practically every 600-volt application —one that simplifies your ordering, stocking, installing, makes possible new economies in time and money.

Anaconda 20-10 Control Cable has been designed to meet all the exacting requirements for the highest quality control cable. Each conductor is insulated with 20 mils of polyethylene, then covered with 10 mils of Densheath (PVC). This construction combines the full IPCEA recommended insulation thickness (30 mils for 600 volts) with the flame retardance, excellent color coding and abrasion-resistance of PVC.

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Write for descriptive bulletin DM-5844 for complete technical details on Anaconda 20-10 Control Cable. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

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FOR 20-10 CONTROL CABLE

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WORK PIECE – Electronic Chassis — 10" x 14" — 23 holes — 5 sizes — 4 different shapes — 4 corner notches

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PRODUCTION RUN – 5 pieces

PRODUCTION TIME PER PIECE – 2.8 minutes

For short or pilot runs—model shop and experimental work—no other single machine can match the production capabilities and profit potential of the Strippit Fabricator.

PUNCHES—any round or shaped hole up to 3½" diameter in sheet material — up to ¼" mild steel.

NOTCHES—90° corners — rectangular, radii, vee and special shape edge notches — up to ⅛" capacity in mild steel.

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A UNIT OF HOUDAILLE INDUSTRIES, INC.

In Canada: Strippit Tool & Machine Company, Brampton, Ontario

(*Concluded from Page* 129)

troit 2, Mich. Cecil C. Sprung is the new manager.

The New Orleans warehouse for **Chase Brass & Copper Co.** is now at 1000 S. Jefferson Davis Pkwy.

J. O. Ross Engineering Div., Midland-Ross Corp., has moved to 730 Third Ave., New York 17, N. Y.

CONSOLIDATIONS

Midwest Piping Co. Inc., St. Louis, purchased **Houston Pipe & Steel Inc.**, Houston, a subsidiary of Sparton Corp., Jackson, Mich.

General Cable Corp., New York, bought **Indiana Steel & Wire Co.**, Muncie, Ind., for about $11.5 million. Indiana Steel will be operated as a subsidiary, producing steel wire used in power transmission and communications.

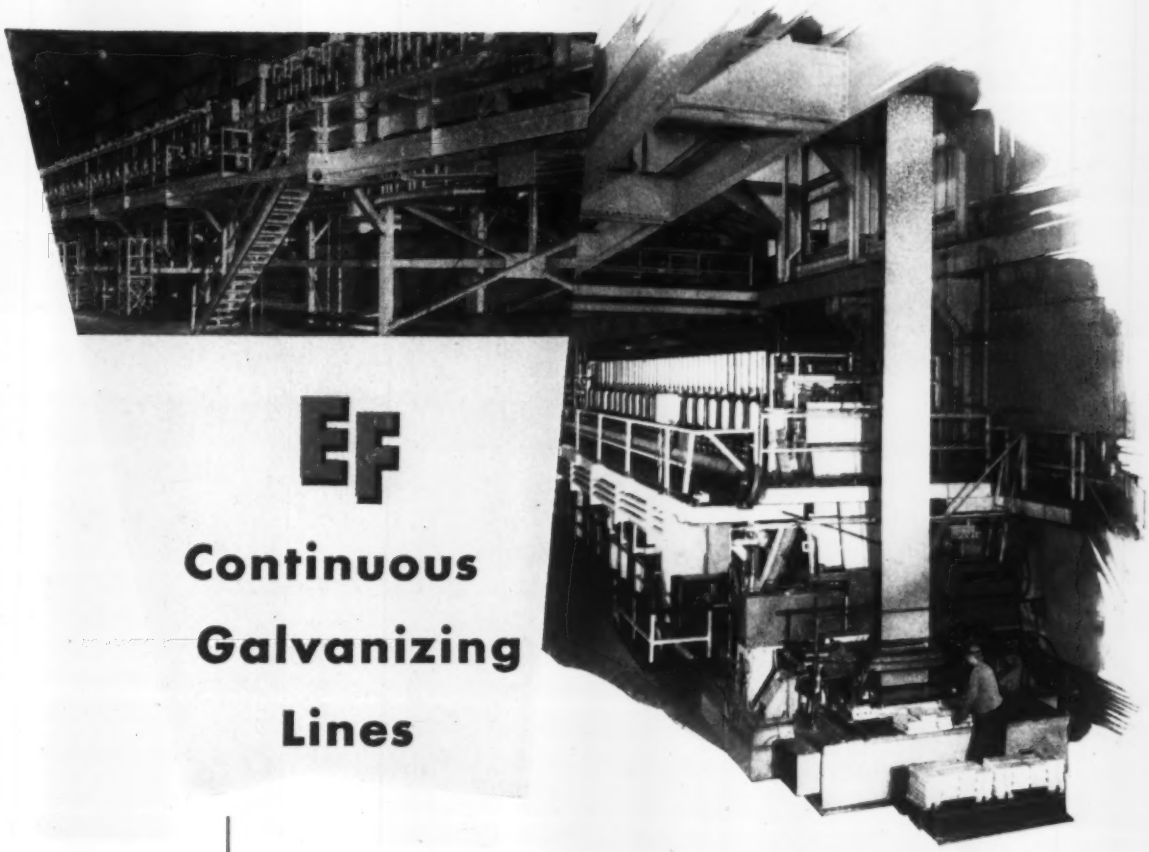
Landers, Frary & Clark, New Britain, Conn., will purchase the fabricating division of **Plume & Atwood Mfg. Co.**, Thomaston, Conn., upon authorization of stockholders to issue 85,000 shares of Landers stock for the acquisition. Cash payment of $1 million is also involved.

Hevi-Duty Electric Co. will merge with **Basic Products Corp.** Hevi-Duty is a subsidiary of Basic. Both firms are in Milwaukee.

Ducommun Metals & Supply Co., Los Angeles, acquired **Barde Steel Co.**, Seattle, service center for hot-rolled carbon steel, cold-finished bars, cold-rolled and galvanized sheets.

Schlage Lock Co., San Francisco, acquired **LCN Closers Inc.**, Princeton, Ill., maker of hydraulic door closing devices. It's the third company acquired by Schlage in the past year.

Cal-Dak Co., San Gabriel, Calif., maker of tubular steel housewares, has purchased **Plas-Tex Corp.**, Los Angeles, producer of polyethylene plastic housewares.



EF Continuous Galvanizing Lines

assure unvarying uniformity of anneal and coating; high daily outputs with no un-scheduled downtime.

TOTAL DESIGN CAPACITY IN EXCESS OF 2,460,000 TONS PER YEAR*

Tailored to meet your specific requirements and incorporating the most advanced techniques, EF continuous galvanizing lines assure users high heating efficiency — accurately controlled cycling — and month after month of continuous, trouble-free, 24 hours a day, 7 days a week operation. You get maximum production — and return — per dollar invested.

The unvarying uniformity of product physicals — the bright even spangle — and the tight bond of the coating, preventing chipping or flaking — assure high market acceptance, and make subsequent forming and fabricating operations more efficient and less costly.

For utmost efficiency and economy on galvanizing operations, and all other continuous, or batch, heat treating of ferrous, non-ferrous or alloy materials, you'll find it pays to consult The Electric Furnace Company heat processing engineers.

* Tonnage output will vary depending upon width and gauge of strip being processed.

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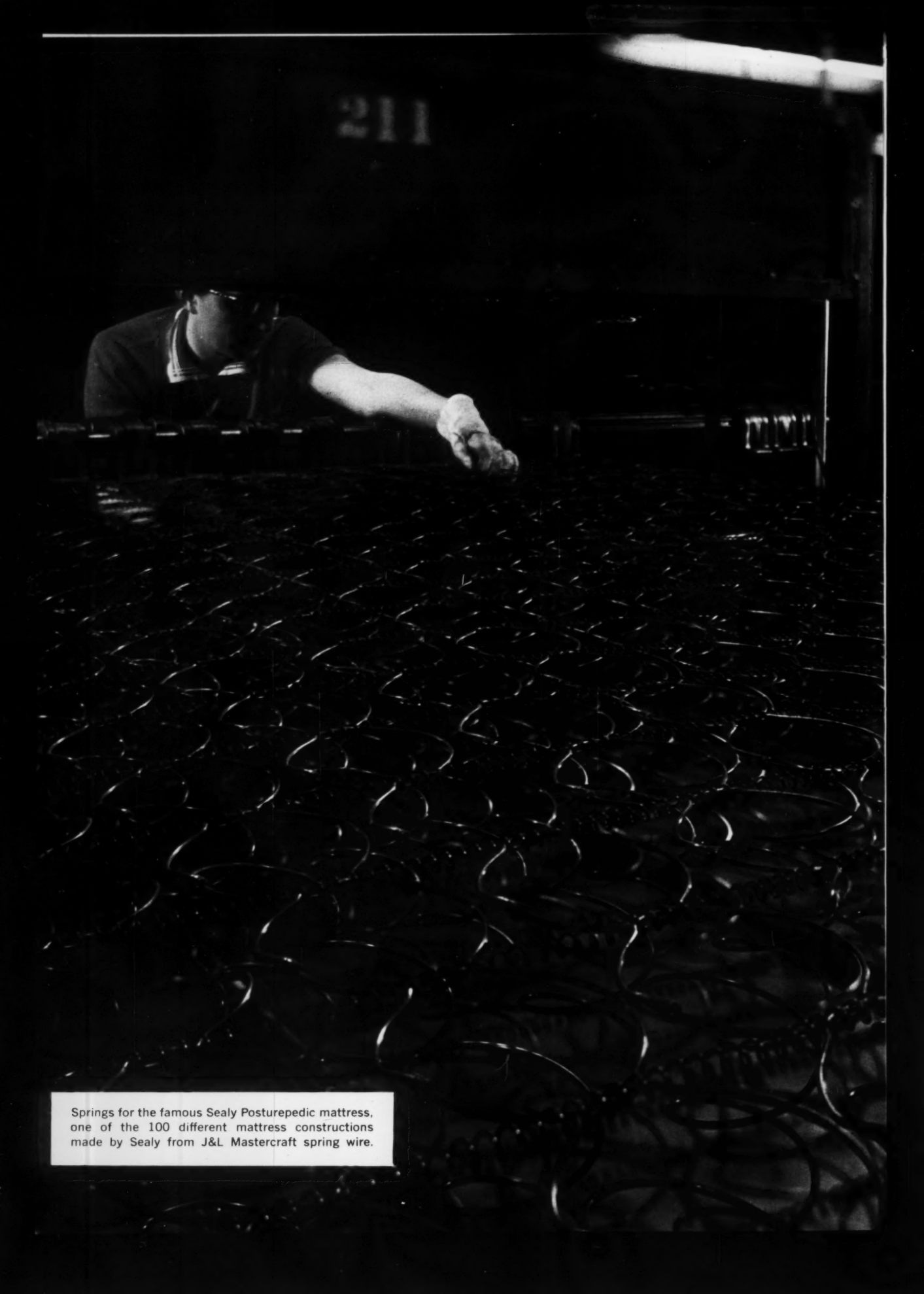
THE ELECTRIC FURNACE CO.

Gas-fired, Oil-fired and Electric Furnaces for Heat Treating any Product, Using any Process, any Hourly Output.

500 West Wilson Street *Salem, Ohio*

Branch Offices in Detroit, Mich., Santa Ana, Calif., and Cheshire, Conn. Canadian Associates, Canefco Limited, Toronto 13, Ontario



Springs for the famous Sealy Posturepedic mattress, one of the 100 different mattress constructions made by Sealy from J&L Mastercraft spring wire.

600 lb. coils of J&L wire
permit longer production runs

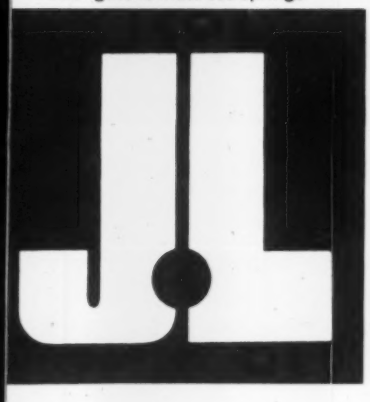
Coilers produce spring coils
60% faster with J&L wire

Automatic lacing machines
bind round coils together

Oil-tempered edge wire
strengthens mattress springs

First step in upholstering a
Sealy Posturepedic mattress

Final manufacturing operation
prior to inspection



J&L wire is also used to make
Sealy box spring units . . .

. . . and box springs and
mattresses for sofa beds

"We can make mattress coils almost twice as fast with J&L spring wire"

. . . reports Sealy Mattress Company of Cleveland, Ohio

"Profitable mattress-making operations require high-speed production of spring coils—and *every* coil must meet established specs," says Larry Higgins, plant engineer of Cleveland's Sealy Mattress Company. "Using J&L spring wire, we can run our automatic coilers at rates well above normal maximums; and the constant adjustment and readjustment of coilers has been eliminated. A single operator can now handle two or more machines instead of just one. In addition, the consistent quality of J&L wire has permitted us to switch from the standard 150 lb. coil to special 600 lb. coils for longer production runs and less down time. And we don't have to reset our machines for each new coil."

Jones & Laughlin Steel Corporation

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THE *BEST* MACHINES MAKE THE *BEST* GEARS

Illustrated is our latest Grinder for Spur and Helical Gears up to 72″ diameter . . . ultra precision work table, accurate to 4.3 arc seconds total accumulative error . . . THIS MACHINE IS THE MOST ACCURATE LARGE GEAR GRINDER IN AMERICA . . . Ultra High Precision Gears ground on this machine open new horizons of accuracy and performance of Large Gearing for Radar, Marine, Turbine, Jet Engines, Diesel Engines, High Speed Shears and many similar applications . . . Phillie Gear has 5 additional High Precision Gear Grinders.

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Virginia Gear & Machine Corp. • Lynchburg, Va.

Technical Outlook

May 25, 1959

RIVET STANDARDS SET— Dimensional standards for semitubular rivets were agreed upon by members of the Tubular & Split Rivet Council at a recent meeting in Chicago. Purpose: To encourage the use of standard sizes in product design. Copies are available from the Council at 53 Park Pl., New York, N. Y.

HOT, HOT GREASE—A new high temperature lubricant called kiln car grease works well at 1200° F, says E. F. Houghton & Co., Philadelphia. It's based on fine particle graphite.

CHEAPER CHROME— You can get anhydrous chromic chlorides for $2 a pound, a tenth of its former cost, says Salem-Brosius Inc., New York, because of technical advances it has made in refinement. The chemical is used for chromizing, vapor or gas plating, and flame metallizing.

NEW FUEL FOR ROCKETS— Liquid hydrogen is the latest proposal for chemically fueled rockets. Dr. J. C. Moise, Aerojet-General Corp., Azusa, Calif., says it gives better performance than other easily used fuels.

ELECTRONICS FOR LILLIPUTIANS— A breakthrough in molecular electronics involving germanium crystals may result in systems 1000 times smaller and lighter than today's, says the Air Force. Westinghouse Electric Corp., Pittsburgh, has a $2 million development contract.

ELECTRONIC READER— High speed electronic systems that read pictures or printing are not far off, says RCA, New York. Its Princeton, N. J., laboratory is developing a device for that purpose.

PLUTONIUM AIDS FOUNDRYMAN— Moisture in sand is accurately measured by a device which uses a small amount of plutonium sealed with beryllium powder in a stainless capsule. James H. Smith, general manager, General Motors' Central Foundry Div., Danville, Ill., says: "We have been able to maintain a far more exact moisture content this way."

CUTS DIE COST 70 PER CENT— A new method being patented is said to chop die making costs radically. The developer, Payne Tool & Engineering Co., Springfield, Ohio, says the dies replace conventional types and will blank up to 1 million pieces in 1 in. mild steel before resharpening or replacement. Dies are made of a standard metal alloy.

BETTER FORGING DIE— A new castable forging die operates efficiently at 1600° F, says Armour Research Foundation, Chicago. It has also developed a high temperature lubricant for use with the die. Benefits: Better quality, closer tolerances, lower costs.

ARMY NEEDS AIR AGE DESIGNS— Contractors thinking in terms of Army markets must remember that requirements call for light, airborne equipment which will do a heavyweight job. It's all part of today's over-all war concept that stresses extreme mobility, says Maj. Gen. H. N. Toftoy, Aberdeen Proving Grounds, Md.

ELECTROSLAG WELDER— A new welding device based on the Russian electroslag method can make superior buttwelds up to 20 in. thick in one pass. The machine, called Vertomatic, is made by Arcos Corp., Philadelphia. Advantages: No edge preparation, greater speed, less current, fewer welding rods, and less flux.

HEAT FOR TRUCK CABS—An experimental catalytic device for radiant heating of truck cabs is said to burn LP fuel more efficiently than current techniques. The unit will have local outdoor applications as well, says Oxy-Catalyst Inc., Wayne, Pa.

Metalworking Outlook—Page 81 Market Outlook—Page 171

Meet the Winners Of STEEL's Cost Crisis Awards

These metalworking managers were honored for their outstanding use of capital equipment to achieve lower unit production costs

A FOUNDRY achieved a productivity boost worth $103,815 a year. A metal fabricator saved enough to trim his product price nearly 18 per cent. Another company got its $10,000 investment back in the first year.

Those success stories, and others like them, were singled out by 196 judges (all metalworking managers) in STEEL's 1958 Cost Crisis Competition as the country's outstanding examples of optimum use of capital equipment.

To each of the winning companies, STEEL's editors presented an inscribed Atmos perpetual motion clock. The clock award pays tribute to managers at all levels for creating a climate in which plans and proposals can be translated into production efficiency.

Each of the managers who submitted the winning entry was presented a framed Award Certificate as recognition of his contribution to his company.

The ten winners are:

Pioneer Industries Inc., Sioux City, Iowa

Radiation Counter Laboratories Inc., Skokie, Ill.

General Foundry & Mfg. Co., Flint, Mich.

Technicraft Laboratories Inc., Thomaston, Conn.

Studebaker-Packard Corp. (foundry), South Bend, Ind.

Cambridge Wire Cloth Co., Cambridge, Md.

Electric Steel Foundry Co., Portland, Oreg.

Reliance Electric & Engineering Co., Control Div., Cleveland

Eclipse Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.

Eaton Mfg. Co., Axle Div., Cleveland

Presentations have been made to all winners except Studebaker-Packard Corp.

The second annual STEEL Cost Crisis Awards Competition is underway.

Entrants will tell how they beat the Cost Crisis through more efficient use of materials.

Four areas are being explored: 1. The substitution of a tailored shape for standard mill products, or vice versa. 2. The use of a standard purchased material instead of a special, or vice versa. 3. The standardization of two or more separate purchases into one. 4. The substitution of one alloy for another of the same basic material.

Your entry can be a winner. Write today for your Cost Crisis Awards Kit. Address: The Cost Crisis Editor, STEEL, Penton Bldg., Cleveland 13, Ohio.

COST CRISIS AWARDS

Eaton Mfg. Co., Axle Div. Cleveland

John C. Virden, Eaton's chairman and president, admires his company's award from Editor Walter J. Campbell (right). On the left, winner R. E. Wilbert, methods supervisor, and R. C. Ochs, general manager, Axle Div., hold the awards. At Eaton, a custom transfer system is saving $38,436 annually

COST CRISIS AWARDS

Eclipse Pioneer Div., Bendix Aviation Corp. Teterboro, N. J.

Assistant Factory Manager William J. Doerr, who made three equipment changes that save $17,589 a month, looks on as Roy H. Isaacs, division general manager (center), receives the company award from John S. Morgan, associate managing editor

COST CRISIS AWARDS

Pioneer Industries Inc. Sioux City, Iowa

Looking at the article that won the award for Pioneer Industries are Sam Kaplan, company president, and Iowa's governor, Herschel C. Loveless. Holding the article is Vance Bell, associate managing editor, who presented the awards. The article was submitted by L. F. Kohl, general superintendent, Pioneer Industries

COST CRISIS AWARDS

Reliance Electric & Engineering Co. Control Div., Cleveland

For the application of a turret press that saves $2252 a month, Reliance's award is presented by Irwin H. Such, editor-in-chief, to William R. Hough, (on right), vice president-engineering and operations group vice president. Award winners: W. J. Nemeth, methods engineer, and R. J. Krivacek, manager-quality control

COST CRISIS AWARDS

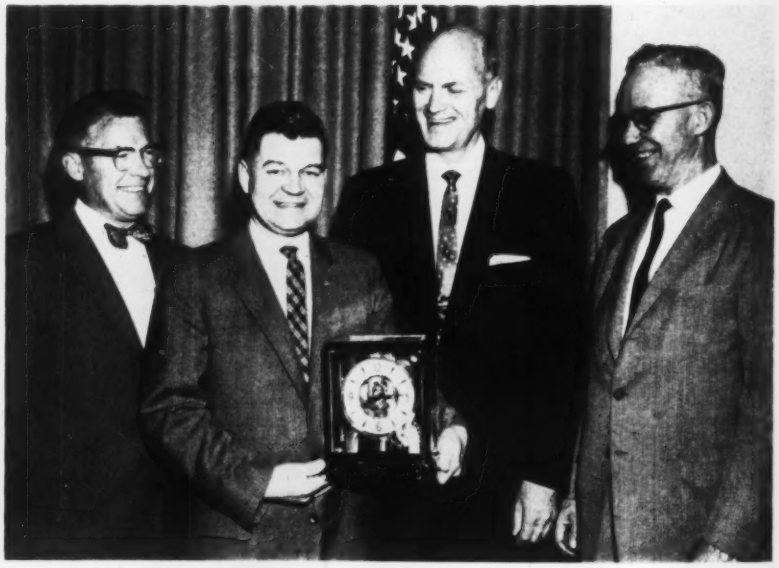
Radiation Counter Laboratories Inc. Skokie, Ill.

STEEL's Campbell, congratulates Dr. Ernest Wakefield, president, (right) on the company's application of a fabricator duplicator that cut hole punching costs. The award winner is Vernon Brown, plant manager

COST CRISIS AWARDS

Electric Steel Foundry Co. Portland, Oreg.

Jack B. Sieforth, director of work simplification (second from left), receives his award from Associate Editor Ross Whitehead. J. J. Davis, vice president (left), and H. M. Gowing, public relations manager, also offer their congratulations. Inspection changes brought a productivity gain worth $103,815 a year



COST CRISIS AWARDS

Technicraft Laboratories Inc. Thomaston, Conn.

Turret lathe modifications cut part costs 35 per cent and won awards for (left to right) J. R. Nye, president, Robert W. Witty, production engineering supervisor, and A. R. Anderson, vice president. R. F. Huber, machine tool editor, presented the awards

COST CRISIS AWARDS

Cambridge Wire Cloth Co. Cambridge, Md.

President E. N. Evans (left) Henry Murphy, plant engineer (right) accept the awards for production innovations that cut labor costs 50 per cent, boosted productivity 75 per cent. STEEL's Irwin H. Such made the presentations

COST CRISIS AWARDS

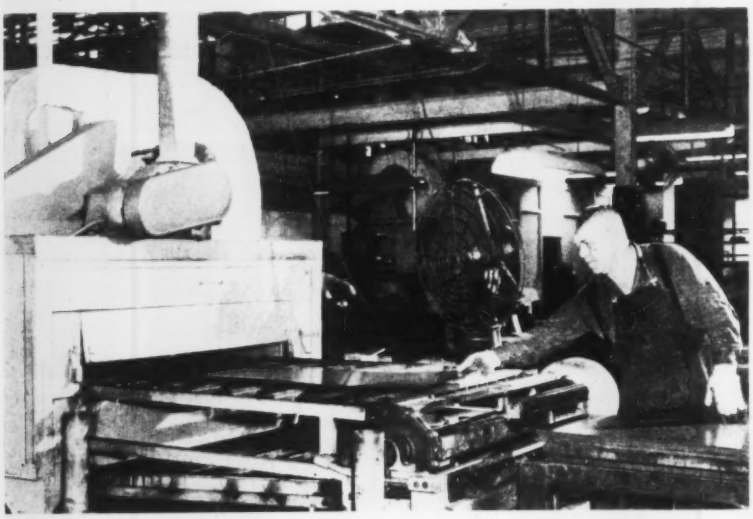
General Foundry & Mfg. Co. Flint, Mich.

Mechanization of the firms cupola charging system cut labor costs 41 cents a ton and brought awards to O. E. Sundstedt, president, (left) and W. Arthur Coakes, plant engineer (right). STEEL's Huber congratulates them

Kold-Lube Cuts Costs 11% at Kelvinator

American Motors Corp.'s appliance division finds the dry coating saves on die life and cleaning costs

Roll hardness and speed control the application of Kold-Lube at AMC's Kelvinator Div. plant, Grand Rapids, Mich.



Coated sheets come out of the drying oven at less than 150° F. They can be stacked without sticking and stored up to seven weeks without corroding

ADOPTION of a dry coat drawing lubricant has enabled American Motors Corp.'s Kelvinator Div. to lop 11 per cent off its fabricating costs in stamping appliance cabinets. The Grand Rapids, Mich., plant is realizing a 20 per cent savings in cleaning operations. Scrap losses have been reduced 22 per cent due to better die life and easier maintenance.

The process is H. A. Montgomery Co.'s Kold-Lube system which leaves a transparent, residual dry film averaging 150 milligrams per square foot of surface to be coated. The water soluble lubricant does not require heated cleansing or coating solutions. Coated sheets come out of quick dry ovens between 135 and 150° F. They can be stored indoors 90 days without corroding—the coating does not deteriorate in that time. The coated metal will not skid or block when stacked. In some cases the compound permits the use of commercial quality instead of higher priced drawing quality steels.

• **Use Spreads**—Kelvinator was the first plant to use the Kold-Lube process. It went into operation in February, 1958. Since then, the Detroit lubricant firm has established lines for GE's Hotpoint Div., Chicago; Whirlpool-Seeger Corp.'s, Evansville, Ind., plant; C. M. Hall Lamp Co., Detroit; GM's Fisher Body Div. plant, Grand Rapids, and others. Chrysler Corp. is installing one coil and one sheet coating line in its Twinsburg, Ohio, stamping plant which will operate at 200 fpm. Kelvinator's experience shows how the process works.

• **Process** — Preblanked sheets are run through a stretcher leveler which also cleans the metal surfaces. Chemical controls are not required. The cold solution is composed of one part Kold-Lube cleaner to four parts water. Kelvinator formerly used kerosine for cleaning. The steel does not have to be completely clean for coating, but excess mill oil must be removed. AMC has found that the cleaner the steel, the better it works.

Next step: Sheets are conveyed to a special roll coater made by

Specifications Kold-Lube DB-2311
(A liquid concentrate of soaps and synthetic polymers)

Specific Gravity	**1.01**
Weight per gallon	**8.4 lb**
Viscosity	**300 centistokes @ 70°F**
pH	**7.2 (Hydrion paper)**
Odor	**Neutral**
Diluent	**Water**
Coverage	**4,000 sq ft/gal**
Humidity	**Slightly Hygroscopic**

Advantages

- **Increased production.**
- **Reduction in scrap.**
- **No interference in welding.**
- **Reduction in die maintenance.**
- **Progressive die lubrication.**
- **Reduces steel quality and gage requirements.**
- **Indoor corrosion protection.**
- **Simplified inspection and removal.**
- **Reduction in labor and product inventory.**

Murray Way Corp., Birmingham, Mich., or Gassway Corp., Chicago. The lubricant, containing 30 per cent active ingredients and 70 per cent diluents, is fed into a sump, then pumped up over the doctoring rolls at room temperature. Again, no chemical control is necessary. The amount of compound to be applied is determined by roll hardness, roll adjustments, and material viscosity.

• **Dries Quickly**—Coming out of the rolls, the sheets are automatically fed into a drying oven. Steel moves through the dryer at 60 to 70 fpm. The drying process takes about 30 seconds. The coated sheets come out of the oven under 150° F; they can be handled easily by machine operators. They are stacked on pallets ready for the press line.

Kelvinator's equipment will handle hot and cold rolled sheets, and enameling iron up to 60 in. wide and from 22 to 16 gage. They represent 95 per cent of the steel the division processes. Only a few odd shaped blanks that won't go through the coater are not Kold-Lubed.

• **Cleans Easily**—After stamping, parts are automatically conveyed through an alkaline degreasing bath. Before the Montgomery process was installed, a heavy duty standard alkaline cleaner was used. Kelvinator's chemical laboratory reports the dry lubricant requires a less concentrated cleaner (Montgomery recommends ¼ ounce per gallon). The division is saving 20 per cent in cleaning costs alone and parts come out cleaner.

Savings have also resulted from longer die life and less maintenance on dies and stamping presses.

Downtime is reduced as much as 25 per cent. For example, Kold-Lube permits a 25,000 press run on a 28 in. door panel without requiring dies to be checked and readjusted. Another benefit to Kelvinator: Working conditions have improved because operators find the dry coated steel easier and more pleasant to handle.

• **Experiments**—Currently, the division is experimenting with reduction of gage and changing from drawing to commercial quality steel. The plant has made some small production runs with commercial quality sheets, but the material was hand-picked in selected lots from the mill. Commercial quality material is now ordered; an inspector selects higher quality coils for Kold-Lubing and shunts the other steel to less critical stampings.

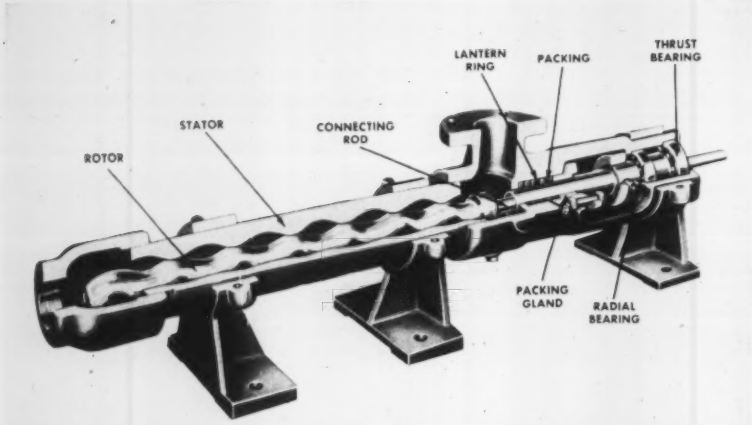
• **Other Advantages**—In addition to the advantages Kelvinator has discovered, R. W. Montgomery, general manager for the lubricating firm, points out that the basic Kold-Lube formula, DB 2311, has several variations to meet different requirements. Welding operations can be done without removing the coating.

"Since it's a cold system, the line can be shut down for long periods and started up immediately without our having to preheat cleaning or lubricating solutions," he adds. Equipment takes up less space than many systems. The minimum basic line is 18.5 ft long. It can be integrated into automatic coil stamping lines. The company has patents pending on the products and on the process which controls lubricant application. Mr. Montgomery says firms often can convert their drying ovens and can rebuild stretcher levelers for cleaning sheets.

The company has also set up a pilot plant in Cleveland to coat steel for firms which may not want to buy their own equipment or which want to try out the process. Called Kold-Lube Coaters Inc., the plant opened in mid April. Since then it has been operating seven days a week. Mr. Montgomery hopes to establish similar facilities in Chicago and Detroit. Ultimately, the company would like to see customers have steel shipped from the mill to the coating plant, then forwarded to their stamping plants.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Pump Eliminates Downtime;



Screw type unit has a tool steel rotor that turns in a synthetic rubber body . . .

It Cuts Maintenance Cost

Water with suspended abrasives doesn't cause excessive pump wear

The unit ran for over three years without a breakdown. The previous pump required a major overhaul every nine months —resulting in a three day shutdown

PUMPING liquids with abrasive particles in suspension?

You'll be interested in a pump that takes little maintenance and cuts downtime to a minimum.

A screw type pump, called the Moyno, supplies water to spray rough castings at Fitchburg Foundry Inc., Fitchburg, Mass., a subsidiary of Kingsbury Machine Tool Corp., Keene, N. H. The pump, made by Robbins & Myers Inc., Springfield, Ohio, carries water containing sand, slag, and metal fragments.

• The spray system supplements a casting washer. It recirculates water containing abrasive particles.

The foundry flushes cores and removes sand or slag with a casting washer, made by Pangborn Corp., Hagerstown, Md. A supplementary spray system throws water, at more than 300 psi, against the fresh castings. It operates at least 7 hours every working day and saves 87 per cent of the manpower needed for hand cleaning.

Water is re-used. Some abrasive particles are trapped by baffles, but others, held in suspension, pass through the pump. Needed: A pump that can carry the grit-contaminated water without wearing excessively.

• The pump, which works on the screw conveyor principle, was in operation more than three years without a breakdown.

The six stage, progressing cavity pump is driven by a 50 hp motor; a 75 hp motor was needed for the previous pump. A tool steel rotor, turning at 780 rpm in a synthetic rubber stator, delivers water at 365 to 400 psi.

Simple design permits maintenance to be done on weekends, when the spray system isn't in use.

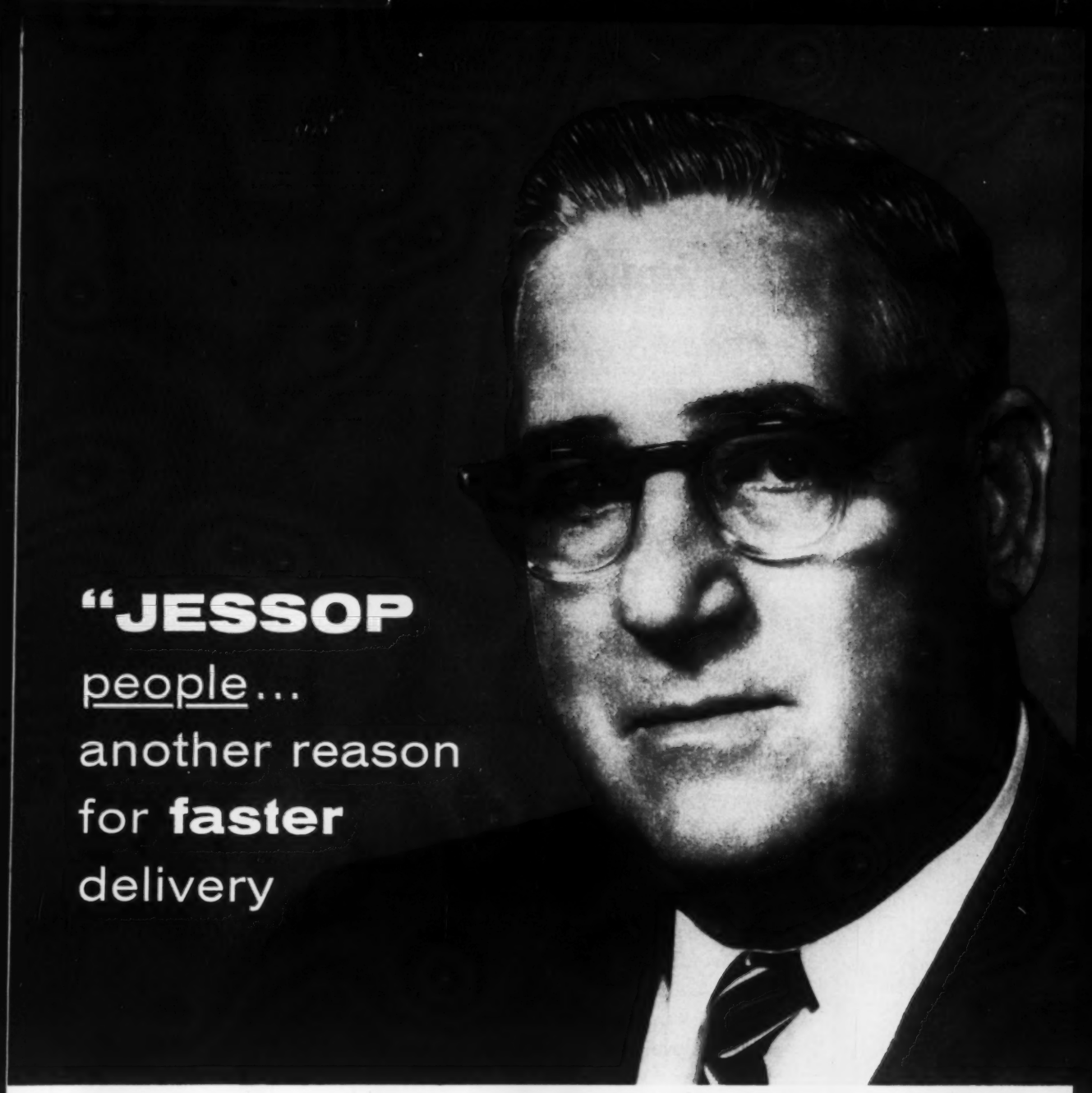
The pump ran for more than three years before it required major repairs. It failed only when a large piece of metal escaped the baffles in the circulating system, breaking the rotor and tearing the stator. The stator, rotor, rotor head, and connecting rod were replaced. Total cost: $1100.

• With the previous pump, frequent breakdowns and overhauls caused foundry shutdowns.

The original pump wore excessively because of abrasives in the recirculated water. Repair bills and shutdowns offset labor savings promised by the spray system.

The pump had to be overhauled every nine months. The job took three days and made a foundry shutdown necessary.

Each overhaul cost about $1200. Service cost on the pump, in the seven years it was used, was estimated at $12,000.



"JESSOP people... another reason for **faster** delivery

"My name is C. E. Rice—executive vice-president of Jessop Steel Company and Green River Steel Corporation. During my 37 years in the industry, I've come to realize more and more just how important *people* are in a steel mill.

"And Jessop people are a good reason for your *confidence* in specifying Jessop specialty steels. Here's why . . .

"Most of our men are 20 year veterans, and a large percent of our personnel are stockholders. All are *personally* interested in making certain you get *exactly* what you order . . . and on the date promised!

"At Jessop, there's no buck-passing through a maze of super clerks. Every man works actively as a part of the fast-moving Jessop team.

"When you need high quality specialty steels, call Jessop. Our service will keep you sold."

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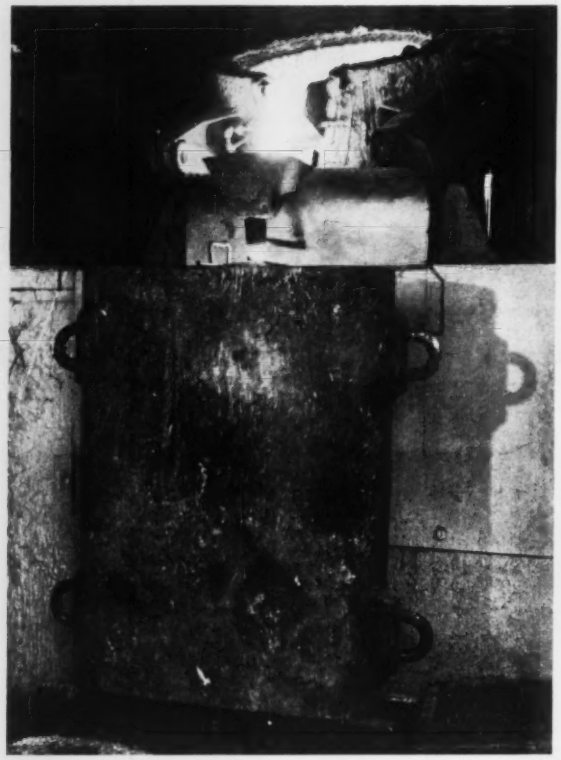
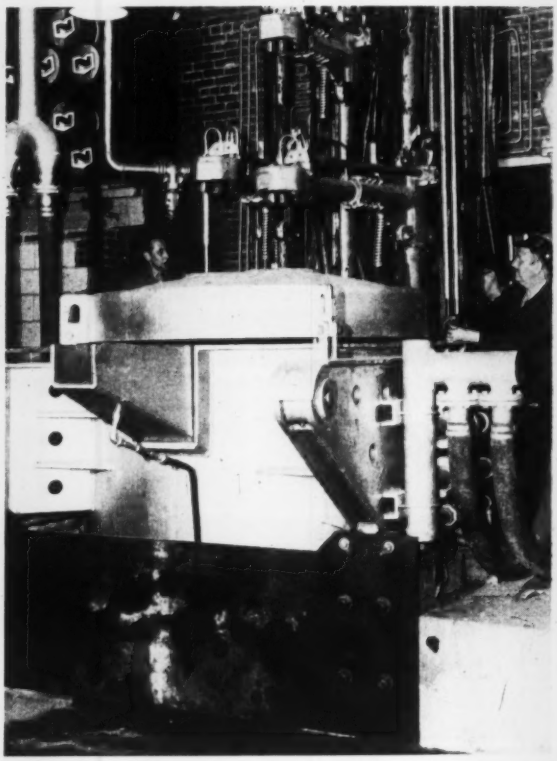
Slag Washing of Stainless Steels Graduates from Pilot Stage

Pilot Furnace



New $100,000 Furnace



Eastern Stainless Steel Corp., developer of method to cleanse titanium bearing stainless, adds $100,000 furnace to melt a special slag into a washing material (liquid flux)

USERS of washed titanium bearing stainless steel have a bigger supply at their beck and call.

Eastern Stainless Steel Corp., Baltimore, developer of the "cleansing" process, has moved it out of the pilot stage by adding to its facilities.

The addition: A $100,000 flux melting furnace, which supplements a pilot furnace.

The two furnaces melt a special flux material through which stainless steel is poured in the "cleansing" process. This, the company says, removes a remarkably high percentage of inclusions that ordinarily plague stainless alloyed with titanium.

• **Benefits**—As a result, there is no banding, segregating, or agglomeration of inclusions . . . the stainless is clean and free of weak spots that could cause fabrication troubles, the company explains.

Because the material is unusually free from harmful inclusions, sheets, plates, coil and strip made of it can be spun, drawn, machined, or polished without high scrap loss, the company adds.

Eastern calls the process "slag washing." It is synonymous with the term "flux casting" and fluid-mold casting.

• **Where It's Used**—Eastern is using the process on four grades: 321SW (the SW stands for slag washed), A-286, 19-9DL, and 19-9DX.

In sheet form, the majority of these steels are used for the hot parts of jet aircraft engines.

Other applications include high temperature steam service.

The slag washing process can

NOW - A NEW "*Push Button*" FLYING SHEAR

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Hallden Shears can be furnished in processing lines built by leading machinery manufacturers the world around.

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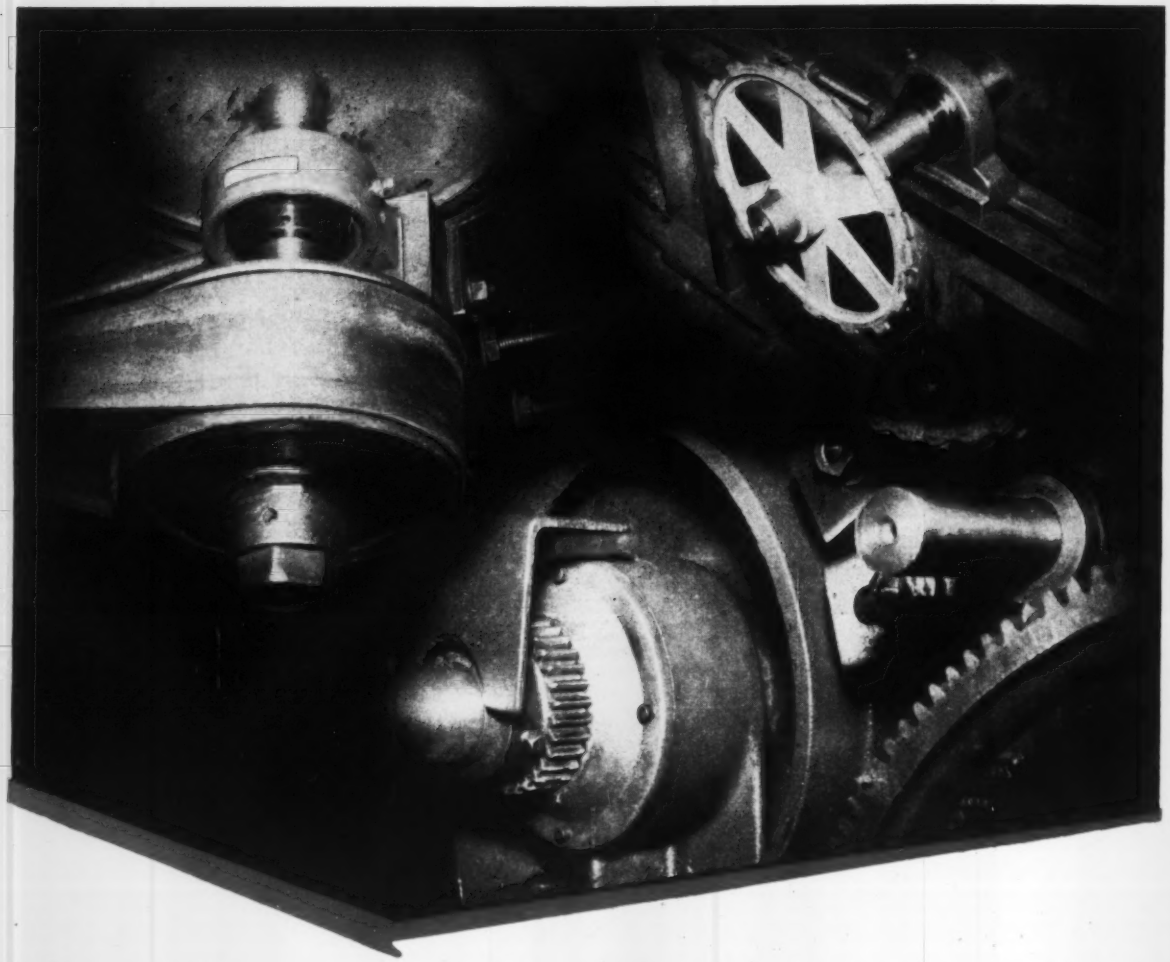

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N. CAROLINA: Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville

also be used for regular commercial grades with proven benefits to steel quality.

• **Buildup**—Slag washing of stainless started at Eastern about three years ago. First, slag was melted in a carbon crucible container in induction furnaces where it could be poured directly into the molds. As a result of this preliminary work, a pilot furnace was built. Now the company is starting to use its new furnace.

Both the pilot furnace and the new one are in the melt shop. The furnaces are electric arc types. The inside of each is steel, the slag or flux forming a lining on the water cooled walls. Water cooling protects this inside steel shell from heat at the elevated temperature at which the slag is used (3000° F).

Melting of the flux is continuous. As melted flux is used, the furnace is refilled with the rocklike, cold flux. It is a special slag (the size of a hickory nut) from Union Carbide Development Co., division of Union Carbide Corp. In fact, since the inception of the slag washing project, Eastern has had the cooperation of this special development division of Union Carbide.

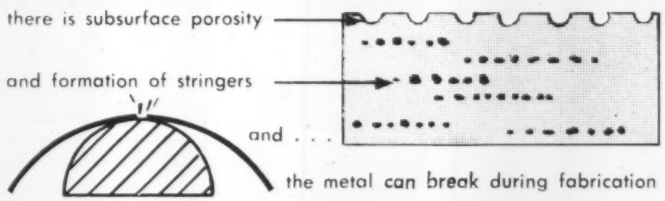
• **For Bigger Ingots** — The pilot slag melting furnace serves molds that make 8000 lb ingots. The new furnace is supplier to molds for 17,000 lb ingots.

Ingots that have been slag washed are smooth. They do not have the customary surface roughness resulting from direct contact with the mold and air oxidation. Oxidation is prevented by the slag that covers the ingot like an egg shell.

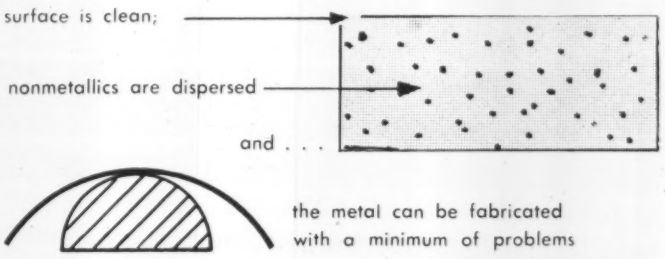
Because the hot flux also retards the rate of solidification, low density contaminants in the steel have time to float to the top of the ingot into the slag for discard. When the slag "egg shell" crumbles away, the stainless steel within is clean. There is no need for surface grinding to eliminate subsurface porosity or contaminants.

The Why of Flux Casting

In nonflux cast stainless,



In flux cast stainless,



Flux Casting Process

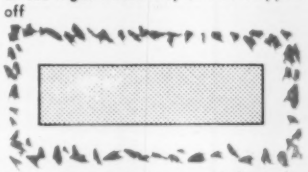
Flux

Titanium Bearing Stainless Steel

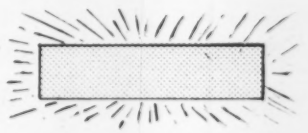
A measured amount of liquid flux at 3000° F is poured into ingot mold an instant before molten steel is teemed into it. This high temperature keeps the flux molten longer and allows gas and impurities more time to float to the surface

Molten, titanium bearing stainless steel is poured into the flux in the mold. A washing action takes place between the flux and the steel, suppressing the formation of harmful inclusions. The weight of the steel pushes the molten flux up the sides of the mold

When teeming of the ingot has been completed, the liquid flux has been forced up the sides and over the top of the steel. Upon solidification, the slag provides an "egg shell" covering for the ingot. This shell prevents porosity of the ingot surface from oxidation, and retards solidification so that low density contaminants in the steel have time to float to the top of the ingot where they can be cropped off



When the ingot is removed from the mold, the black, glassy slag shell containing impurities crumbles away from the solidified steel



"Clean," slag washed, titanium bearing stainless steel ingot is ready to be made into sheets, plates, coils, or strip

Floturning Moves to a New Market

Teamed with other operations, it offers a shortcut to drawing

A MISSILE contractor switched from deep drawing to a process that combines Floturning and reforming. His part costs plummeted from $5.75 to only 78 cents. (Another example is shown below.)

Behind these dramatic savings is a method developed by engineers at Lodge & Shipley Co., Cincinnati, to let you shortcut many drawing jobs. Labeled Flo-Reforming, the process is a tailored modification of the company's already established Floturning operation (STEEL, Mar. 29, 1954).

• **By Floturning the part blank, you can get the forming cycle off to a head start.**

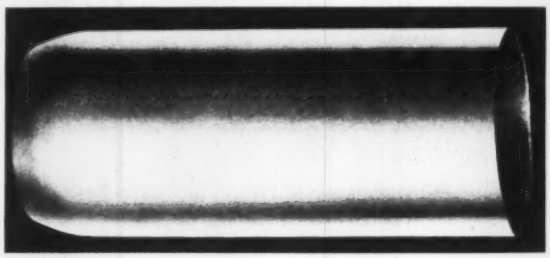
That's the way Claus L. Sporck, vice president of Lodge & Shipley's Floturn Div., explains the operation. The first step is to produce a cone from the flat blank. This cone can then be reformed into a cylinder; lengths can be produced up to three times the cylinder diameter in one forming operation.

Mr. Sporck feels the process can help eliminate many intermediate drawing stages necessary on some parts. It can also get rid of the attendant annealing steps.

• **It will compete with drawing. Also, it may make practical some one piece parts that now must be fabricated.**

All kinds of pressure vessels, including oxygen bottles and fire extinguishers, should be ideal for the process, says Mr. Sporck. In addition, he sees a host of other applications, including: Shell cases, rocket fuel cases, all bottomed cylinders where parts now must be welded and where the weld might be detrimental (as in food and chemical industry parts), automotive shock absorbers, and hydraulic equipment.

Claus Sporck, who pioneered Floturning in this country, holds a 302 stainless steel cylinder, 2½ in. OD and 14 in. long. The part started as a blank, like the one in his right hand, was Floturned to a cone like the one on the table, reformed to a cylinder (bottom right), then given a final reform



How It Pays

Problem:

Produce 500 stainless steel shells, 3 in. OD, 7⅛ in. long, with a wall thickness of 0.042 in. Here are the two methods considered and their comparative costs.

Drawing

The ten steps in the sequence include two shearing operations, three draws, two washes, two anneals, and a trim. The costs:

Material (Each part starts as a 9 5/16 in. square blank, 0.060 in. thick.)	$638.00
Tooling	$3,000.00
Factory Labor	$83.00

SELLING PRICE .....$3.20 EACH

Flo-Reforming

The six steps include a shear, Floturn, wash, anneal, trim, and reform. The costs:

Material (Each part starts as a 6 3/16 in. square blank, 0.125 in. thick.)	$524.00
Tooling	$1,640.00
Factory Labor	$61.00

SELLING PRICE .....$2.28 EACH

STEEL PIPE BY WHEELING

Primary carrier of gas!

It's an easy step from gas field to kitchen stove – thanks to strong, dependable gas carriers like Wheeling Pipe.

Yet the amazing strength and dependability of Wheeling Steel Pipe are but two of the many reasons why it's so widely used in gas transmission. For example, workers like Wheeling Steel Pipe because it welds easily, strongly and quickly. And buyers like it because of the low, low per-year cost!

For details on dependable, economical Wheeling Continuous Weld Steel Pipe–black and galvanized, see your Wheeling man or write Wheeling Steel Corporation, Wheeling, W. Va.

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Always insist on pipe made in the U. S. A.

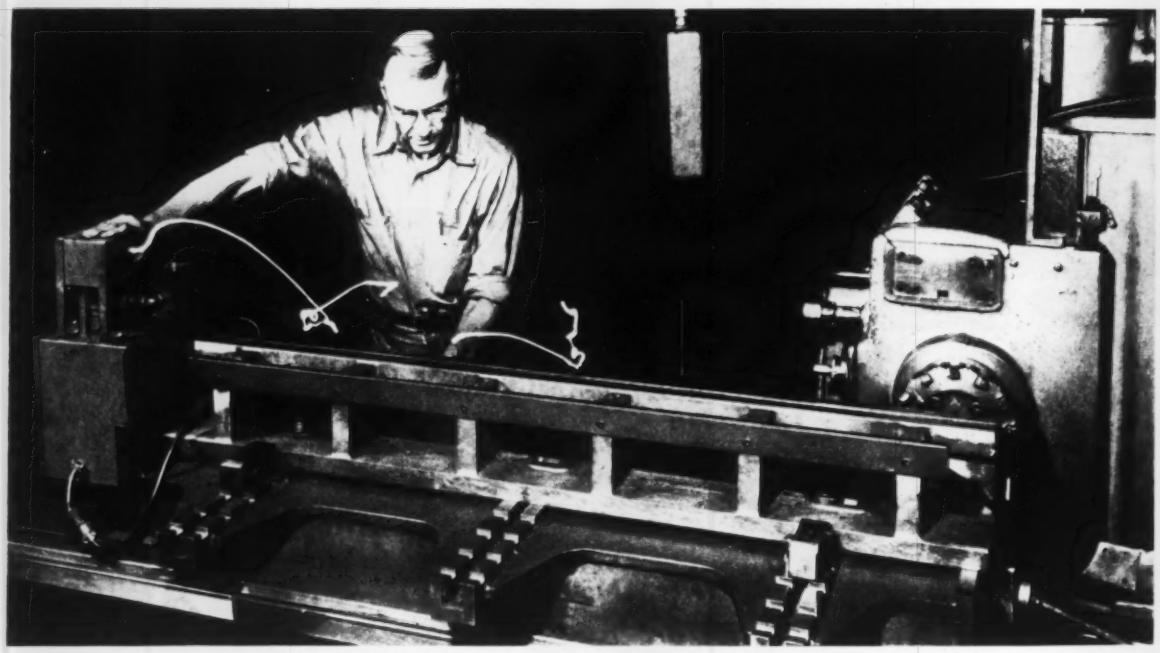
WHEELING STEEL CORPORATION · IT'S WHEELING STEEL! *District Sales Offices at Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Houston, New York, Philadelphia, St. Louis, San Francisco, Wheeling*

Wasting a Lot of Motion in Loading?

Electromagnetic Fixtures Can Help You

They hold parts securely and can be loaded quickly. Some important side benefits: Reduced vibration and chatter, increased cutter life, reduced operator effort.

Operator is loading the same bar in both pictures. Wrist lights show it takes fewer motions to clamp the bar electromagnetically than with three straps and bolts.



IF YOUR machine loading time is longer than your cutting time, electromagnetic chucks or milling fixtures may solve your problem.

That and other advantages were reported by F. L. Suchanek, Sundstrand Machine Tool Co., Rockford, Ill., at the Twenty-third Annual Machine Tool Electrification Forum, sponsored by Westinghouse Electric Corp.

• An electromagnetic chuck cut loading and clamping time 75 per cent for a shear knife maker.

Other benefits: Cutter life was improved; speeds and feed rates were faster than those obtained with mechanical clamps; and vibration and chatter were reduced.

The work was done on a 50 hp

milling machine with a heavy duty trunnion fixture made by Sundstrand.

The electromagnet is controlled from the machine pendant. An interlock is provided so that the feed motor won't run unless the electromagnet is on.

• Accuracy and distortion problems can be eased.

In another application, heavy mechanical clamping pressures necessary to hold transmission housings caused distortion. When pressure was released, the top and ends of the housing were not flat within required limits.

The problem was solved by locating the housing with two dowels in a horizontal electromagnet, then adjusting the vertical electromagnet until it registered against the side surface.

The control elements for this fixture are in a portable control station. It's independent of the machine pendant control.

• Even small parts can be held.

For example, the device is being used on a slotting cutter that's $\frac{5}{8}$ x $\frac{5}{8}$ x 5/16 in. and is slotted 0.090 in. wide and $\frac{1}{2}$ in. deep. About 23 per cent of the mass of the part is removed in the slotting cut. Cutter life between sharpenings averages 30,000 parts, or about 2140 cycles.

• Electromagnetic clamping may be the only way to make an operation economical.

In one application, a small refrigerator valve plate is face milled on both sides in a reciprocating milling cycle. It's a Meehanite casting $\frac{3}{8}$ x $2\frac{1}{2}$ in. x 2 in. The operator loads one fixture while the other is in the cut.

Trip dogs on the table control the fixture. Two transformer rectifier units independently control each fixture. Production averages 170 per hour at 85 per cent efficiency.

• Vee fixtures for milling keyways are popular.

Small diameter cutters can be used. Shafts can be grouped closely so that more parts can be handled per machine cycle. It also means improved cutter life, higher production, and lessened operator effort.

Allis-Chalmers has come up with a small protective relay without moving parts. Three knobs adjust the ranges of the inverse time and instantaneous current elements. Relay operation is indicated by neon lights that operate in combination with a pair of memory cores

Protective Relay Smaller, Uses Light Semiconductors

A STATIC protective relay, one-third the size of the conventional induction type, has been developed by Allis-Chalmers Mfg. Co., Milwaukee.

It has no moving parts. Semiconductors (transistors, diodes, thermistors, varistors) are used instead.

First of the relays will appear in switchgear equipment this summer as production facilities are completed. Development of other types of static relays will continue, such as those which respond to voltage, power, and phase angle. Even translation of pressure, temperature, and light into discrete electrical quantities is possible.

• Advantages claimed by designers:

1. Shock and moisture proof—all components are mounted on a printed circuit board. This is potted with an epoxy-resin.

2. Plug-in construction simplifies installation or removal. Transformer shorting switches are not required.

3. Neon lights for instantaneous and time trip indications replace mechanical targets.

4. The lack of moving parts permits the relay to adjust instantaneously to prevailing load distribution. Where required, resetting speed can be controlled.

5. In combination with induction relays, the static device minimizes co-ordination problems.

6. Calibration and setting, controlled externally, can be done by technicians trained to handle induction relays, with the same instruments.

Its relay characteristics can be easily changed. Present relays include five taps for the inverse-time unit and five taps for the instantaneous trip unit.

One type of relay can be equipped with an integrating double-acting memory device to simulate heating and cooling of an electrical device such as a motor. This permits operation close to temperature limitations without causing unnecessary outages.

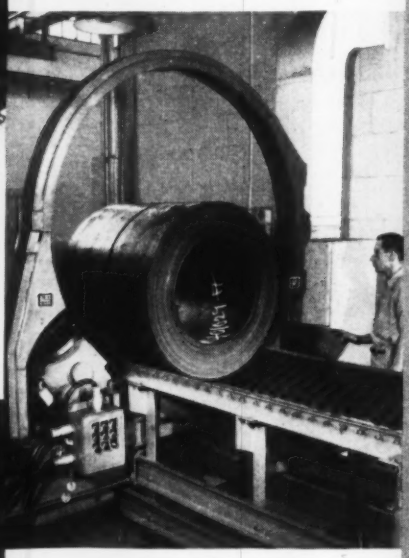
WHERE CAN YOU USE THESE

Versatile powered machines for automated strapping stations

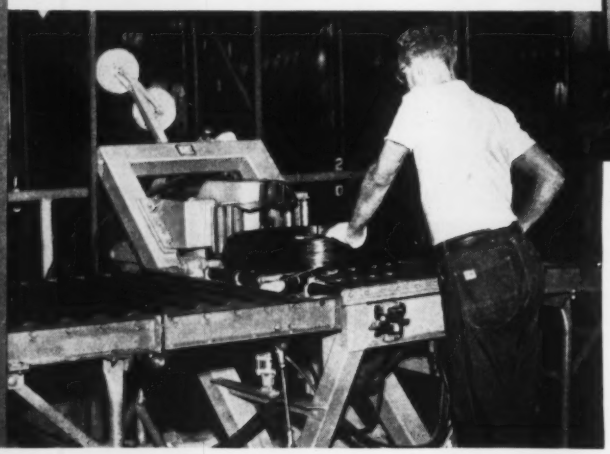
Versatility is a key feature of the new Acme Steel Powered Strapping Machines. Simple in design, compact in construction, they can be mounted in any position and automated to any degree to meet the requirements of the installation. The basic units are augmented with specialized fixtures and accessories to fit your particular production flow and strapping needs.

Let your Acme Idea Man initiate development of Ideas to improve your strapping and packaging procedure based on the versatile new Acme Steel F4 or F5 Strapping Machines.

Conduit is securely bundled and strapped with F4 machines. Strap track and fixtures for nesting and ejecting are built into machine, assuring neat, uniform and tightly strapped bundles automatically. Machines are mounted on tracks for moving in and out for correct spacing of strap regardless of conduit length.



Sheet in coils is strapped by one operator at conveniently placed push button control box. F5 machine is equipped with full track for wide range of coil sizes. Basic tensioning and sealing unit pivots into position and back allowing for variations in coil diameters.



Wire in coils strapped with "push button" F4 machine. Coils of wire are conveyed onto indexing table and rotated into position for each strap. The basic F4 strapping unit can be pivoted by a button control allowing the seal to be applied on either the face or underside of coil.

NEW STRAPPING MACHINES?

This basic unit is the core of a customized strapping station

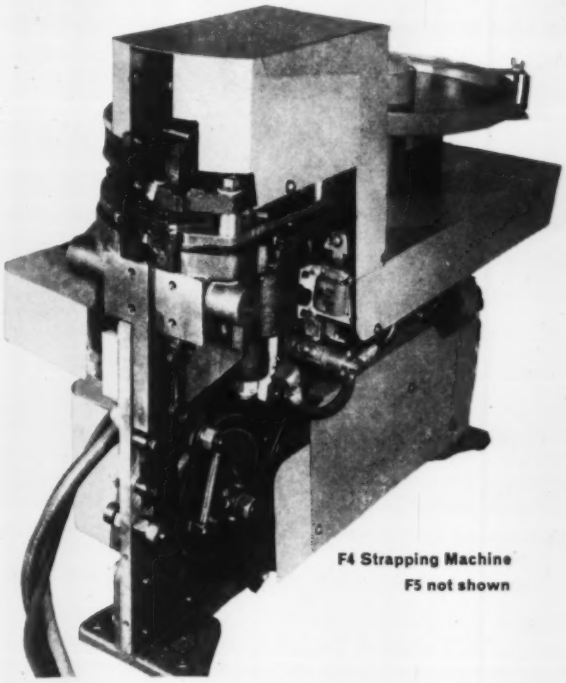
The new Acme Steel Powered Strapping Machine applies strapping to a complete range of packs. It tightens each strap to a predetermined, uniform, dial-adjusted tension, then seals and cuts it. Seals are fed from coils and up to 5000 can be made without reloading. This saves down time and speeds long production runs.

Strap is fed, tensioned, sealed and cut, all with power. And controls can be designed as semi-automatic, automatic, or fully automated.

The new machine is of extremely simple, dependable design. Maintenance is minimal, but when needed is quick and easy due to unusual access features.

The unit can be adapted into any production line. Whatever your strapping problems may be, your Acme Idea Man and engineers will suggest ways the new power strapping machine can be adapted to your needs.

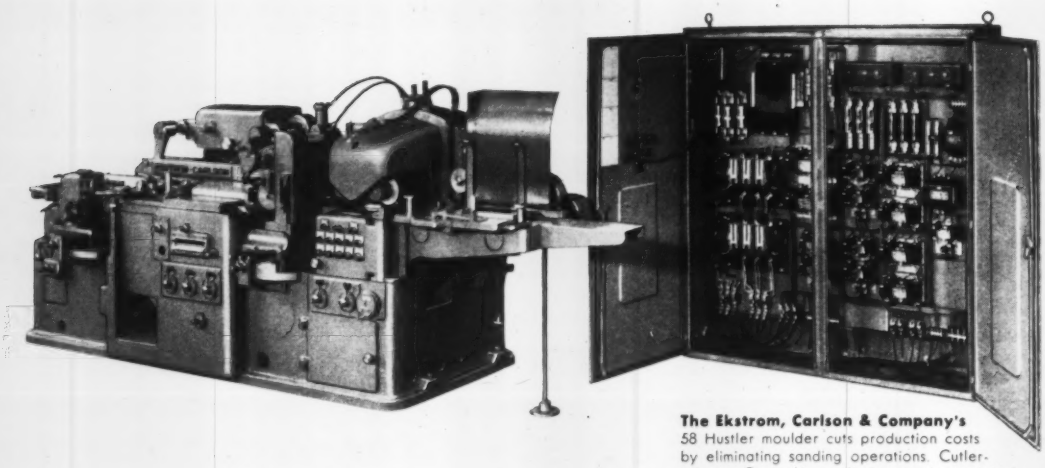
Write Acme Steel Products Division, Dept. SDS-59, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Limited, 743 Warden Ave., Toronto 13, Ontario.



F4 Strapping Machine
F5 not shown

- **Power operation . . . no manual effort**
- **Uniform strap tension . . . dial adjusted**
- **Unlimited strap feed and take-up . . . no limitations on package size.**
- **Makes its own seals**
- **Design simplicity means easy maintenance, dependability**

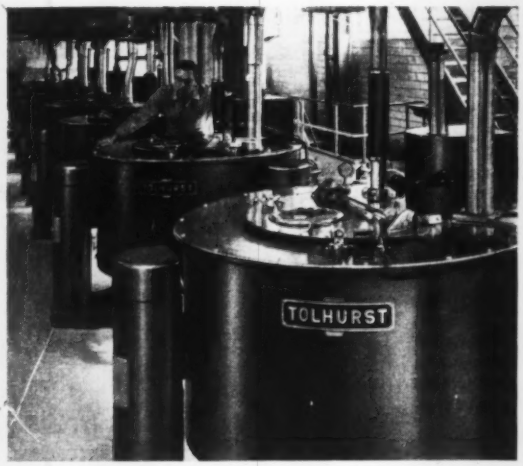
ACME STEEL **STEEL STRAPPING**



The Ekstrom, Carlson & Company's 58 Hustler moulder cuts production costs by eliminating sanding operations. Cutler-Hammer Control is supplied as standard original equipment

CUTLER-HAMMER
CONTROL
C-H

Choice of the leaders ...the mark of better machines



The Tolhurst Division of American Machine & Metals, Inc. manufactures this 48" Dia. Automatic "Batch" Centrifugal for the Chemical Process Industries. The hydraulic drive system is equipped with Cutler-Hammer Control.

National Automatic Tool Co. Inc. uses Cutler-Hammer Control on this NATCO C2A HOLESTEEL drilling machine. Equipped with an indexing table, the machine automatically performs six drilling and reaming operations in 9.6 seconds

The proper performance of any machine requires dependable, trouble-free service from the motor control which directs and protects it. This is why leading machinery builders use Cutler-Hammer Control. It installs easier . . . works better . . . and lasts longer.

For prompt attention to your control requirements write Dept. K213, Cutler-Hammer Inc., Milwaukee 1, Wisconsin.

CUTLER-HAMMER

Cutler-Hammer Inc., Milwaukee, Wis. • *Division:* **Airborne Instruments Laboratory.** • *Subsidiary:* **Cutler-Hammer International, C. A.**
Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.; Intercontinental Electronics Corporation.

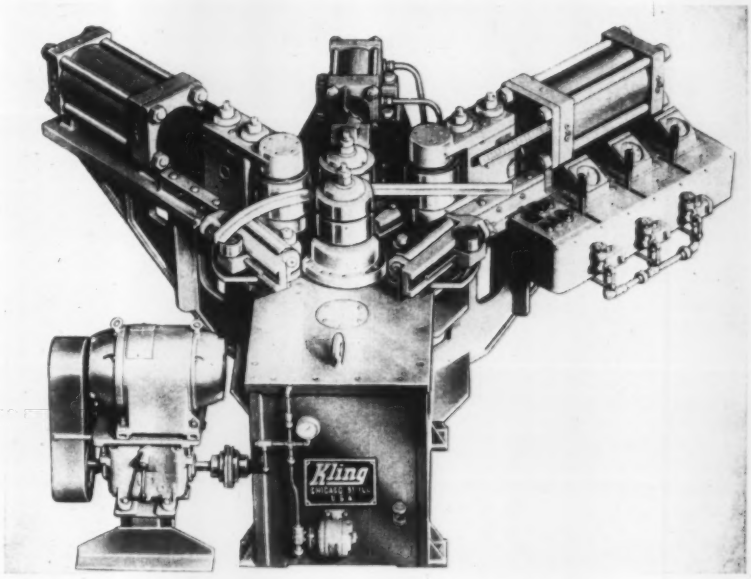
Bending Rolls Eliminate Flat Ends on Angles

AN OPERATOR can bend a steel section completely around the center roll with the Kling horizontal double pinch angle and structural bending roll. The unique action of the machine eliminates 90 per cent of the flat ends which are otherwise unavoidable in angle bending.

Hydraulic pressure provides bending force and at the same time assures maximum flexibility and ease of control. The pinch rolls and gaging roll are actuated by heavy duty hydraulic cylinders. Control levers actuate leakproof pressure flow valves. This arrangement gives the operator instant response and sensitive control of the rolling operations at all times.

A two-stage, high-low pressure pump enables the rolls to be brought into operation quickly, and upon contact with the work, develops full working pressure immediately. The cone type, form gear drive is mounted on antifriction bearings. Herringbone gears run in an oil bath.

For more information, *write* Kling Bros. Engineering Works, 1320-32 N. Kostner Ave., Chicago 51, Ill.



Thin, Portable Conveyors Fit into Cramped Spaces

BECAUSE it is slim, the Bosworth conveyor will fit easily into cramped spaces between machines and within production lines. The unit is only 4½ in. wider, at any point, than the conveyor belt itself.

Of all-steel construction, the conveyor is designed to transport castings, stampings, blanks, screw machine parts, and scrap to another machine or a tote box. It can be quickly set up for any incline angle from 22 to 45 degrees simply by adjusting the telescoping legs.

Eighteen models are available with oil resistant belts that are 6, 12, 18, or 24 in. wide, and 4, 6, 8, 10, or 12 ft. long. The user has a choice of integral 1 in. rubber cleats vulcanized to the belt, metal cleats bolted to the belt, or where high temperatures are present, an all-metal belt.

A standard feature of all conveyors in this line is a loading chute, which is easily adjusted to a 45-degree angle, and a mechanical backstop to prevent parts from sliding off the belt.

For more information, *write* Bosworth Mfg. Co., 34250 Mills Rd., Avon, Ohio.

Abrasive Wheel Machine Lowers Deburring Costs

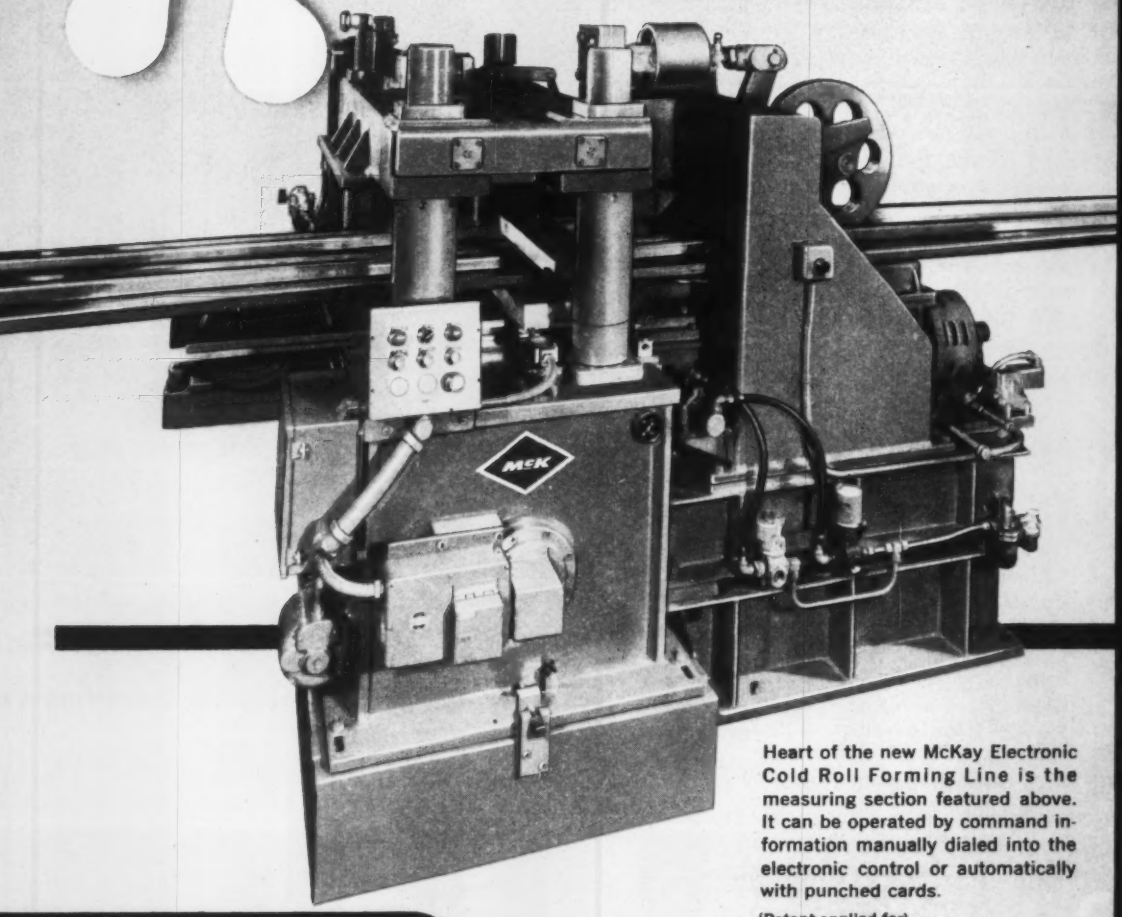
A PROTOTYPE model of a new deburring machine has cut an implement manufacturer's deburring costs on a 24-tooth sprocket from 27.5 to 7.4 cents. Work time per sprocket (two sides) was slashed from 3 minutes (by hand grinding and brushing) to 40 seconds.

The deburring was done by a formed PG wheel (made by Minnesota Mining & Mfg. Co., St. Paul) which moves hydraulically into working position, automatically feeds into contact with the gear, and retracts to the starting position at the end of a prespecified period. The wheel and gear spindles operate in a timed relationship so that the work indexes one tooth for each revolution of the wheel.

The PG wheel is made of hundreds of die cut leaves of coated abrasive fabricated into a wheel and locked at the hub with aluminum

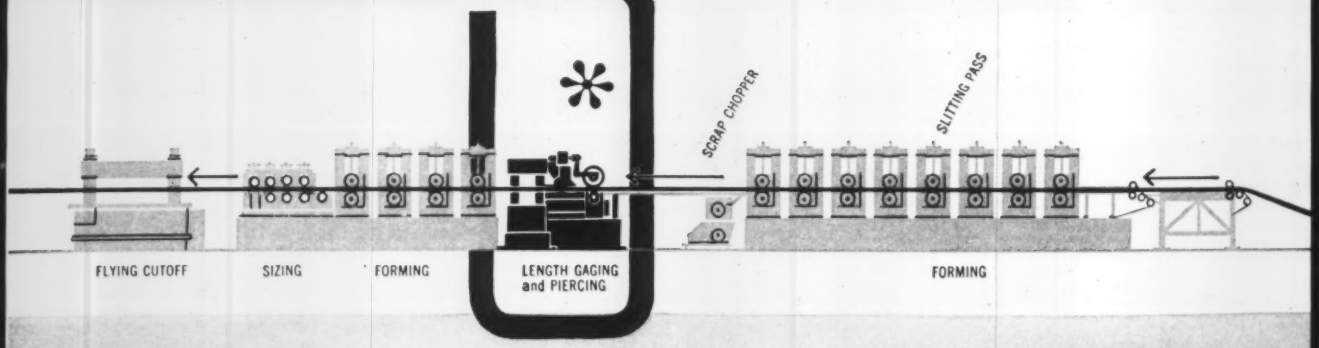
(*Please turn to Page* 160)

10,001



Heart of the new McKay Electronic Cold Roll Forming Line is the measuring section featured above. It can be operated by command information manually dialed into the electronic control or automatically with punched cards.

(Patent applied for)



The line illustrated above was recently purchased by a large building products manufacturer for high speed production of roof and floor deck.

different lengths...

...WITHOUT A MANUAL ADJUSTMENT

McKAY'S ELECTRONIC LENGTH GAGE has a memory permitting instantaneous changes in cut lengths and scheduled quantities as well as precise control of notch and punch spacing on each length.

A transistorized electronic control reads and stores information from punched cards and utilizes an electronic counter to trigger a punching and notching press at precise intervals as commanded by the coded data on the punched cards.

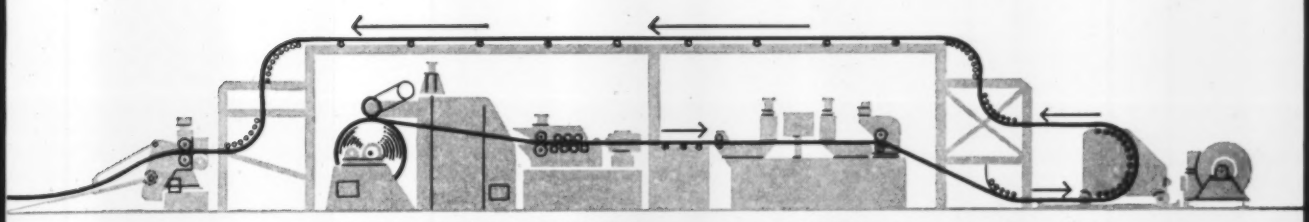
Now! the planning department can schedule the output of a forming or cut-up line without waiting to group identical lengths.

Now! down time previously required for manual length gage adjustment is converted to productive time.

Now! in addition to length control, precise spacing of notches and punches can be controlled and changed by commands received from coded information on the standard data processing card.

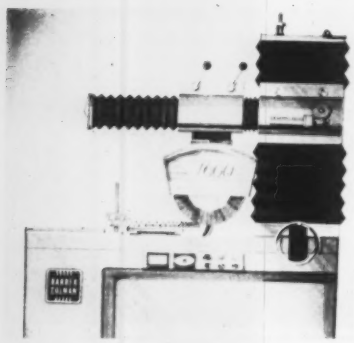
BE SURE TO GET THE FULL STORY ON McKAY'S ELECTRONIC GAGE FOR YOUR PRODUCTION LINES.

Call or write the McKay Machine Company, Youngstown 10, Ohio.



McKAY MCK MACHINE

NEW PRODUCTS and equipment



flanges. Production models of the machine, made by Barber-Colman Co., Rockford, Ill., will employ abrasive wheels from 6 to 14 in. in diameter, and will handle gears up to 16 in. OD.

Scavenger Cleans Out Machine Tool Sludge

THE COST of machine tool servicing can be sharply cut with the new Gorske Sludge Hustler, which provides clean, fast scavenging of sludge mixed with chips, metal solids, waste oil, and water.

Sludge is collected by vacuum, transported to the disposal area, and discharged under pressure. The unit handles well in narrow aisles and between machines. Maximum speed is 15 mph. The engine-driven vacuum generator develops a suction of 32 ft of water, enough to handle the heaviest semifluid industrial sludge.

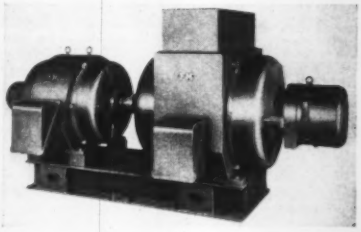
Collection rate is about 60 gpm. When the 150 gallon tank is loaded, a stainless steel float valve closes off the suction. During transport to the disposal area, the vacuum pump is reversed to pressurize the tank.

For more information, *write* Gorske Industrial Equipment, 132 E. 30th St., Indianapolis, Ind.

M-G Set Operates Quietly

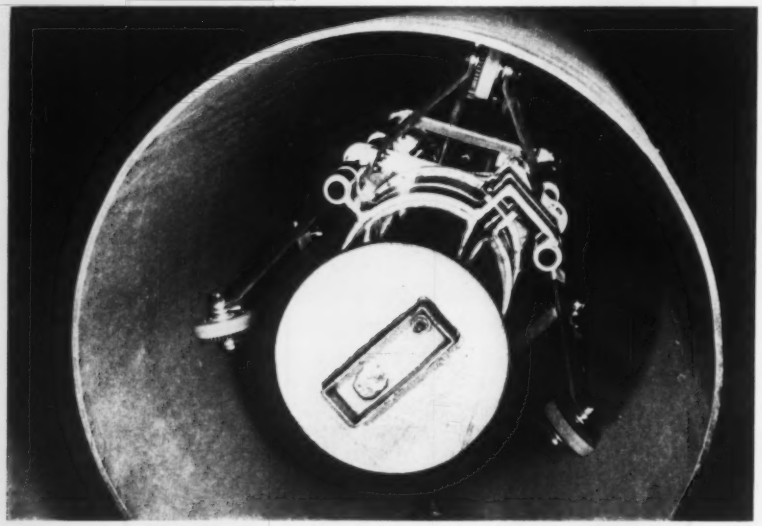
QUIET OPERATION is designed into a 400 cycle 220/440 volt motor-generator set for in-plant use. Noise limiting features:

1. The generator is ventilated straight up which moves noise up



and away from personnel. 2. Noise paths through the generators are acoustically lined. 3. Special rotor slot wedges are used to reduce windage noises.

For more information, *write* Electric Machinery Mfg. Co., Minneapolis 13, Minn.



Unit X-Rays 40 ft of Pipe a Minute

PIPE from 12 to 36 in. in diameter can be x-rayed at the mill or in the field at speeds of up to 40 fpm with a machine called Travel-Ray.

The equipment employs an x-ray tube which projects a narrow beam of parallel rays only, permitting radiography of the longitudinal welds in pipe sections while the x-ray source is in motion. The relative speed of the machine virtually eliminates scatter radiation. Sensitivities of 1 to 1.5 per cent can be obtained.

The Travel-Ray radiographs every inch of every weld, both longitudinal and circumferential. It can be used to x-ray only circumferential welds if desired. Up to 2000 ft of pipe can be radiographed without stopping the machine.

A quick-disconnect cable eliminates the need for reversing the motor at the end of the pipe section, and a rail system is available for high production applications..

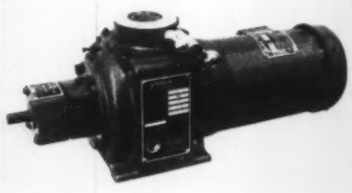
For more information, *write* Travel-Ray Corp., Houston, Tex.

Variable Speed Drive Has Planetary Reducer

A PLANETARY reducer can give you a high torque, infinite range drive with speeds up to 300 rpm. In-line design saves space and permits a package of motor, variable speed drive, control, and reducer that is mounted with only four bolts.

The reducer develops a torque of 100 in.-lb. Built-in overload protection prevents damage to the reducer, transmission, or driven machinery.

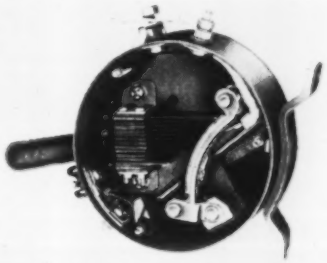
A micrometer control is shown, but the transmission is also available with other controls, including remote micrometer, remote electrical, pneumatic, and automatic con-



Instantly,
Smoothly,
new "Contact Bronze"
applies graduated power
to heavy-duty trailer
brakes

CONTACT!

COSTS 25% LESS
These contact leaves are stamped and formed from Bridgeport "Contact Bronze" Alloy 92 at a savings of 25%. Its performance-proved spring properties provide part reliability through thousands of cycles.



FORMS EASILY
Warner Electric Brake system for heavy-duty trailer combination is actuated by this controller. This view shows the series of easily formed "Contact Bronze" leaves that transmit power in smoothly graduated steps.

This ingenious electric brake system devised by Warner Electric Brake & Clutch Company gives the driver instantaneous synchronization of all brakes. Through a graduated series of Bridgeport "Contact Bronze" leaves, it lets the driver adjust torque smoothly to suit load and road conditions.

"Contact Bronze" Alloy 92 saves up to 25% on material cost. Its quality and dependability are maintained by the addition of a minute quantity of phosphorus for superior spring properties. It easily withstands difficult forming operations without losing its spring properties.

If you form or stamp contact parts for electrical or electronic equipment, you will want details on "Contact Bronze," as well as Bridgeport's other alloys for the electrical industries. Call your nearby Bridgeport sales office for immediate service or, for samples and a copy of the "Contact Bronze" data sheet, write to Dept. 3906.

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NEW PRODUCTS and equipment

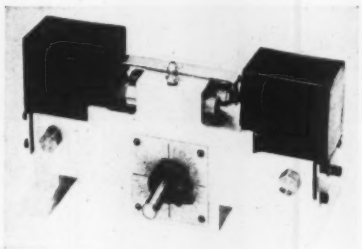
trols. In addition to the planetary reducer, the transmission can be furnished with standard output to provide speeds up to 1800 rpm or with a variety of built-in stepup or stepdown assemblies.

For more information, *write* Graham Transmissions Inc., Menomonee Falls, Wis.

Hydraulic Rotary Unit Provides Reciprocation

A SELF-CONTAINED, hydraulic, rotary torque power unit opens up many possibilities for cutting costs in the operation of machine tools and in aircraft, missile, and commercial applications.

Operating at a power input range from 50 to 1000 psi, the unit converts hydraulic pressure into reciprocating rotary motion that is easily regulated to fit all job requirements. Power output of 100 psi hydraulic pressure will provide 500 in.-lb of working torque over a range of rotation from 5 to 360 degrees.



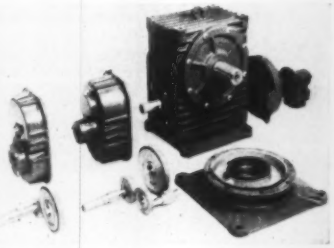
The unit will self-reciprocate within its adjusted range of motion, as well as in semimanual or full manual operation. Electric solenoid actuation is available for either or both directions of rotation.

For more information, *write* Cleveland Pneumatic Industries Inc., 64 Old Orchard, Skokie, Ill.

Gear Reducers Feature Flexibility in Mounting

FLEXIBILITY in mounting and drive arrangements are emphasized in a line of high efficiency, high capacity, heavy duty, worm gear speed reducers.

Helical attachments for double and triple reduction units combine the efficiency advantages of helical gearing with the high ratio advantage of worm gearing. Improved tooth forms, precision ground alloy steel worms, special high strength bronze gears, and ground helical gearing result in space savings up to 50 per cent, compared with conventional worm gear reducers, says the manufacturer.



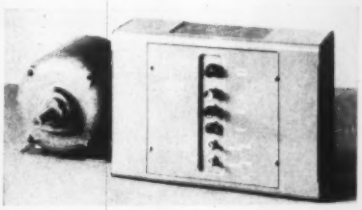
The line has one basic housing design for each size. Standard mounting bases, worm gearing, single and double helical attachments, fans, and torque control attachments permit top, bottom, or side mounting with or without mounting base. All units can be supplied with a torque control attachment to protect driving and driven equipment from damage due to overloads.

For more information, *write* Philadelphia Gear Corp., Erie Avenue and G Street, Philadelphia 34, Pa.

Adjustable Speed Drive Has Good Speed-Torque

MODULAR construction of a line of adjustable speed drives in the 1/6 to 10 hp range permits the user to select only the features required for the application. Optical characteristics include dynamic braking, reversing, jogging, remote control, torque limiting, and line voltage compensation.

The drives use a magnetic amplifier unit driving thyratrons in a full wave circuit, followed by a dc shunt motor. Speed ranges of 100:1



NEW

a super-hard cemented carbide for high speed, high precision machining of steel

CARMET CA604

now added to Carmet's crater-resistant 600 series

Here's a new product of Allegheny Ludlum research to help you meet today's demand for high speed machining of steel. It's an ultra hard tungsten carbide with unusually high crater resistance, wear life and high strength at high cutting temperatures. CA604 operates in the fast cutting ceramic areas, combines high velocity finishing with light to medium feeds. Field tested for more than a year, CA604 is offered in Indexable Inserts and blanks for mechanical holders.

CARMET OFFERS A CARBIDE GRADE FOR CUTTING ANY STEEL ALLOY

CA 604
Extra hard for high speed, high precision machining.

CA 605
For fine finishing and high velocity cuts of steel.

CA 606
For lighter cuts on all steels and magnetic alloys

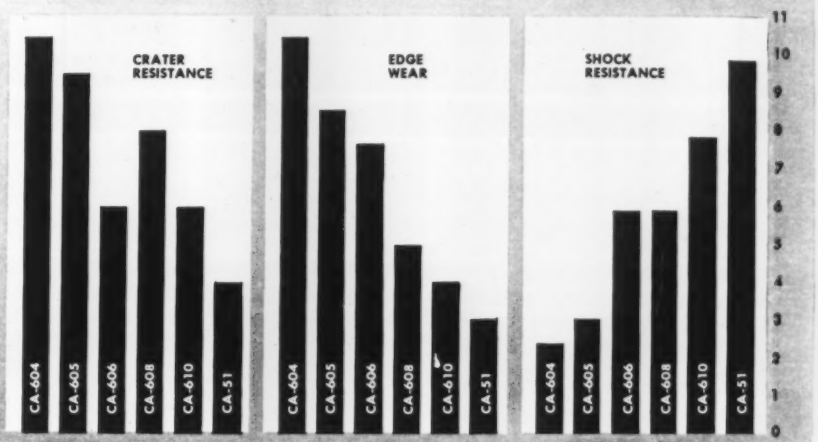
CA 608
For light cuts on all steels; crater resistance.

CA 610
General purpose steel cutting; high shock resistance.

CA 51
For heavy, interrupted cuts; high shock resistance.

Relative Characteristics of Carmet Metal Cutting Grades

This chart shows how grades in the CA-600 Series compare in crater resistance, edge wear resistance and shock resistance. The units of measurement indicate only relationship between grades, not efficiency.



Write for new Catalog C-16

Carmet Cemented Carbides for Industry

This 32-page first edition contains prices and complete specifications on Carmet's full line of cemented carbide tipped tools, Indexable Inserts, blanks and holders. Speed and feed charts, grade comparisons and ordering information included.

ADDRESS DEPT. S-171

Your Carmet Distributor carries Carmet standard tools, holders, and Indexable Inserts in stock, assures prompt delivery and will aid you in selecting the proper grades and styles for economical machining. Call him today or write Allegheny Ludlum Steel Corporation, Carmet Division, Detroit 20, Michigan.

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ALLEGHENY LUDLUM STEEL CORPORATION

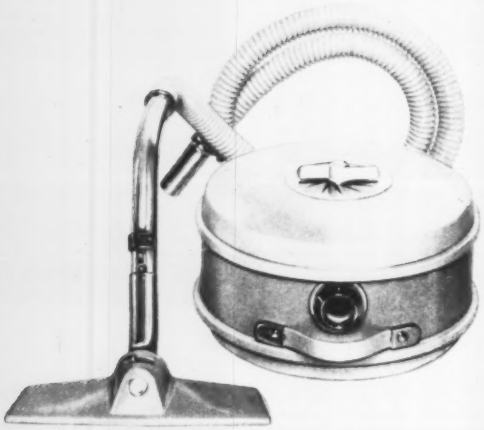
AL

Inland "job-tailored"
Cold Rolled Sheets work better

product: VACUUM CLEANER TANK PART

problem:

produce a handsome vacuum cleaner tank of the upright type, designed in a silhouette for consumer eye appeal. The operation to be a single deep draw. Because of the depth of the draw and the severe shaping, a sizeable amount of breakage could result. The required draw also produced stretcher strains in the shaped tank which handicapped later finishing operations.



solution:

quality standards were met and the problem overcome by "job-tailored" Inland Cold Rolled, Drawing Quality, Aluminum Killed Steel. This steel, specifically recommended for the job, successfully took the deep draw and pattern formation required. Stretcher strains were eliminated and an excellent surface obtained for all subsequent finishing.

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INLAND

Cold Rolled Sheets

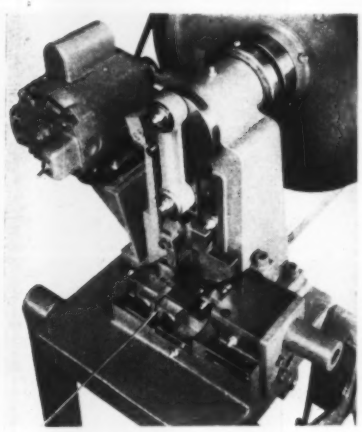
and regulation percentages of 1 to 2 per cent are attained without tachometer feedback. A standard duty line (Series 25) covers the range from 1/6 to ¾ hp. A heavy duty line (Series 200) is available in the 1/6 to 10 hp range.

The manufacturer also announces a nonelectronic line (Series 35) for use where exacting speed regulation is not of prime importance. Available in the 1/6 to 3 hp range, these drives use adjustable autotransformers and rectifiers.

For more information, *write* Cleveland Machine Controls Inc., 1155 Brookpark Rd., Cleveland 9, Ohio.

High Speed Tube Cutter Produces Burrless Parts

UP TO 235 pieces of steel, copper, aluminum, and other metal tubing can be cut per minute on the Novi Model 500, high speed, tube cutting machine. It works on pieces as short as 1½ in. and holds this length to plus or minus 0.005 inches



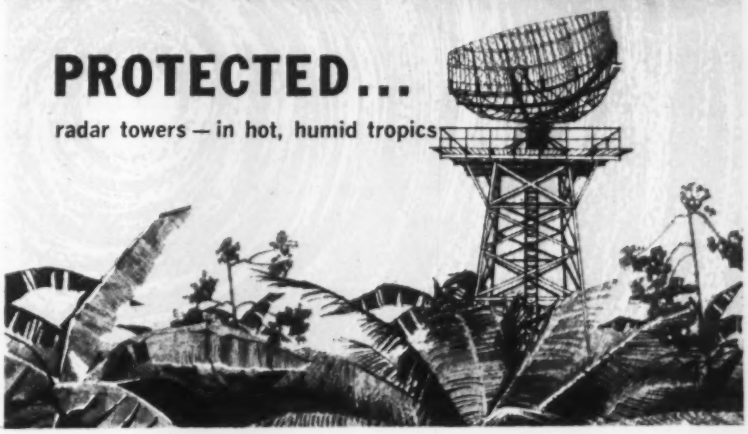
with parallel faces.

The unit is designed to cut tubing from ⅛ in. in diameter having a 0.028 in. maximum wall thickness, to ½ in. diameter tubing having a 0.060 in. maximum wall thickness. Exclusive of operator wages, the new machine has produced up to 1400 tube pieces per penny of machine costs.

In manual operation, tubing is hand fed through radius cutoff

WEBSTER
gal-va-nize (găl'və nīz'), *v.t.* 1. to simulate by or as by a galvanic current. 2. to coat (metal, esp. iron or steel) with zinc.

PROTECTED...
radar towers — in hot, humid tropics



radomes — in frozen arctic wastes
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USAF Photos. Zincilate (Spec. MIL-P-26915) is approved as alternate to hot-dip (ASTM-A123) galvanize under Spec. MIL-T-26433, Towers, Temperate and Arctic.

Zincilate *can* provide true galvanic protection for these vital components in our radar defense network, because Zincilating is the new method of galvanizing — as modern as a missile.

Zincilating can be done anywhere, any time, on any product or structure of any size or shape. As on these radar towers, where Zincilate was brushed on to repair faults and weaknesses of an old galvanizing method. No pre-treatment of the original galvanize was required.

Zincilating saves time, money, materials and manpower. As on radome maintenance, where *three* coats of ordinary material should be applied to every structure during the 60 days suitable for maintenance work, but where *one* coat of Zincilate actually affords more complete, longer-lasting protection because it dries faster and harder under arctic conditions.

Zincilate, applied by spray, brush, roller-coat or pressure curtain, has much to offer any company working in iron, steel or aluminum, for military or commercial use. Write, without obligation, for complete information including military specification approvals and certified test reports.

PROTECTION that SELLS your PRODUCTS
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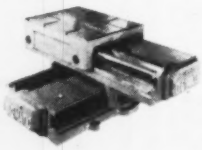
Write for free 12-page booklet "DIGIMATIC MODEL 202." Also—movies shown at your shop or plant on request.

Tape Unit



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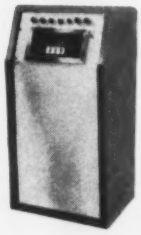

Control Console

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NEW PRODUCTS and equipment

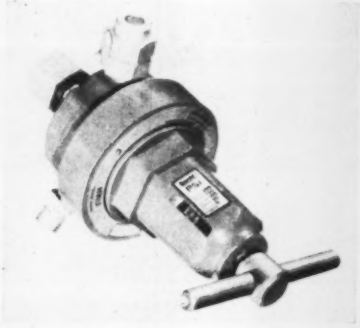
blocks to a stop. The operator starts the cutoff cycle by depressing a foot control. The cutoff holding blocks close in on the tubing, holding it rigid and positively positioned. Specially designed shearing knives cut the tubing. At work, the machine bed can be tilted backward to allow parts to fall directly into tote pans.

For more information, *write* Novi Tool & Machine Co., 25806 Novi Rd., Novi, Mich.

Regulators Are Gageless

ELIMINATION of costly gage breakage and replacement is possible with a new line of Oxweld industrial gas regulators. The units can be used with oxygen, acetylene, or propane on cylinders or manifolds.

Delivery pressures are calibrated on an anodized aluminum plate on the cap of the regulator. The delivery pressure is shown by an indicator running in the slot alongside the calibrated reading. As the pressure adjusting screw is turned in or out, the delivery indicator moves to the desired pressure.



Cylinder pressure is shown by a metal indicator unit on the regulator body. A metal indicator shaft extends ¼ in. from the indicator body when the cylinder is full and drops into the body as the cylinder pressure decreases.

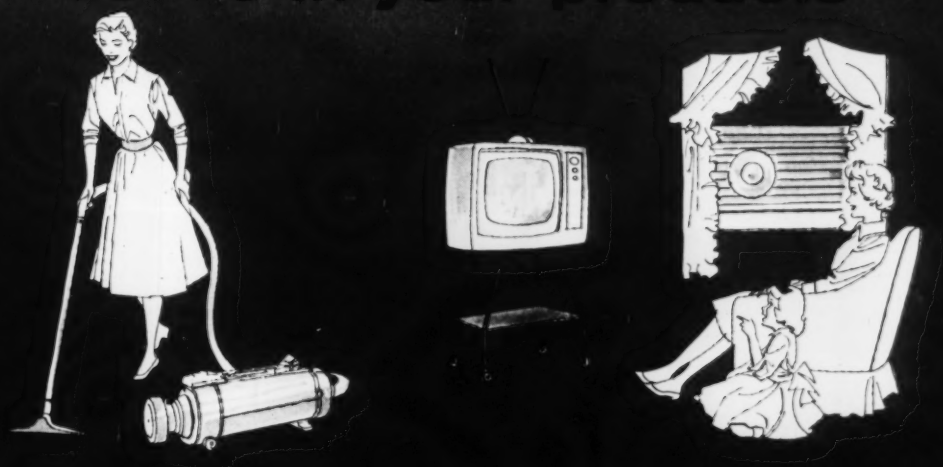
Use of a minimum number of parts in the regulators reduces wear problems. It is rarely necessary to replace parts other than the stem, seat, or diaphragm.

For more information, *write* Linde Co., division of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.

QUALITY

It's in our steel

so it's in your products



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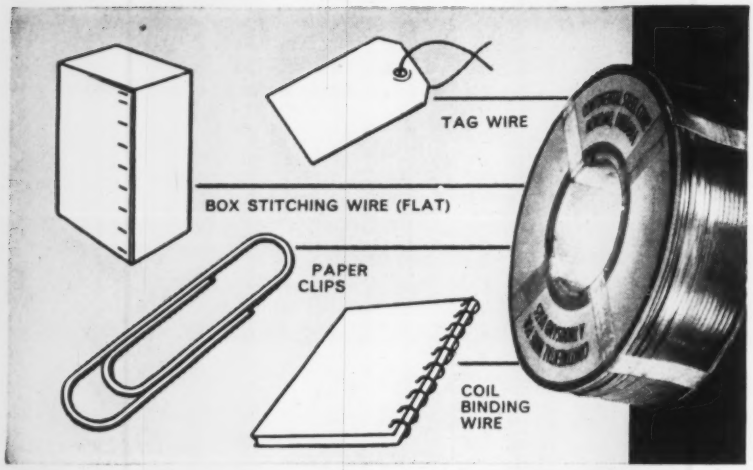
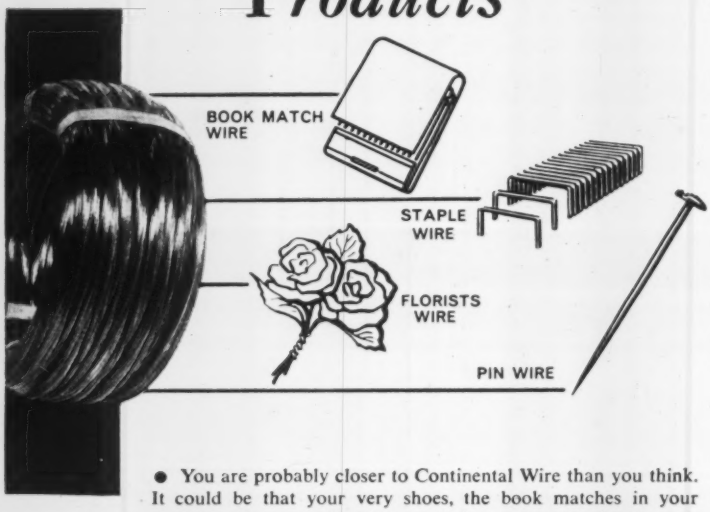


Fine and Specialty Wire for Super Fine Products



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NEW Literature

Write directly to the company for a copy

Plastic Sheets, Rods, Tapes

An 8-page catalog lists available shapes and sizes of Teflon plastic, its properties and applications. Cadillac Plastic & Chemical Co., 15111 Second Blvd., Detroit 3, Mich.

Lubricants for Chain Drives

"Lubrication of Roller and Silent Chain Drives" covers principles of lubrication, maintenance, and oil selection. Industrial Products Dept., Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa.

Muriatic Acid Data

Comprehensive data on the production, uses, properties, and handling of muriatic acid are contained in a 40 page brochure. Stauffer Chemical Co., 380 Madison Ave., New York 17, N. Y.

Values for Gases or Liquids

A 36 page catalog provides specifications, performance data, specific application information, and optional features of over 200 solenoid valves of bronze and stainless steel construction. Atkomatic Valve Co., 545 W. Abbott St., Indianapolis, Ind.

Thermosetting Mortars

Two data sheets are available on Penntrowel, a resinous, thermosetting mortar for coating concrete, cement, and other surfaces, particularly in highly corrosive atmospheres. Corrosion Engineering Products Dept., Pennsalt Chemicals Corp., Natrona, Pa.

Packaging of Steel

"Eleven Ways to Reduce Costs and Improve Your Packaging of Steel" describes packaging setups from complete automation to simple strapping tools. Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.

Fastener Fit Checklist

"Common Thread Fit Problems . . . Their Symptoms and Detection" lists seven common fit problems, noting possible causes, and gaging devices needed to detect them. Standard Pressed Steel Co., Box 944, Jenkintown, Pa.

Beryllium Booklets

Two booklets on beryllium are being offered. One (12 pages) describes properties, chemical analysis, and applications of UOX beryllium oxide. The second (4 pages) describes the hot hardness properties of four beryllium copper casting alloys. Brush Beryllium Co., 4301 Perkins Ave., Cleveland 3, Ohio.

Centrifugal, Rotary Pumps

A 72 page catalog illustrates centrifugal and rotary pumps for a wide range of industrial uses. Pioneer Pump Div., Detroit Harvester Co., 21800 Greenfield Rd., Oak Park 37, Mich.

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May 25, 1959

Ship Steel Before July, Users Demand

DELIVERY PRESSURES are mounting as steelmakers fall behind on shipments.

In the Midwest, some fabricators are so concerned about their steel supplies that they're asking top brass to ride herd on orders. For the first time in years, company chairmen and presidents are phoning the mills, sending telegrams, and making personal calls in an effort to expedite shipments. A year ago, the shoe was on the other foot. Top executives from the mills were calling on users in a desperate effort to scare up some business. Even if everything steel consumers ordered was coming in on schedule, they would be in trouble because they didn't order enough. Business picked up faster than they expected. As a result, recent deliveries haven't been large enough to replace steel taken from inventory.

STRIKE FEARS PERSIST—Three weeks of discussion between the industry and the United Steelworkers on terms of a new contract have done nothing to allay consumers' fears of a lengthy strike. Some fabricators may have bought too much; others may have placed duplicate orders. But few have seen fit to cancel. If the USW strikes all the companies with which it has contracts expiring on June 30, only 12 per cent of the industry will be unaffected (see Page 89).

MILLS WARN OF DELAYS—Typical of the warnings that steelmakers have been sending their customers is this letter from a Chicago mill: "We regret to inform you that because of circumstances beyond our control, we are now running late on our production schedules. From all indications, this situation will not improve in the immediate future, and it is expected that by June 30 we will be four to five weeks behind."

FIRST THINGS FIRST—If there is no strike, July might not be as slow as most steelmen thought a month or so ago. It will be a catchup month. Any orders that customers had sent in specifying July delivery will be held in abeyance until the back orders are filled. And unless the delivery situation improves in the next five weeks, that could represent considerable tonnage. Some mill officials are revising third quarter operating estimates up to 65 per cent of capacity if there is no walkout. Buyers who put third quarter orders on mill books just to get rolling preference may find that doesn't guarantee delivery.

CARRYOVERS IN SHEETS, PLATES—At Chicago, steelmakers are at least four weeks behind on flat-rolled carbon, galvanized sheets, and sheared plates. Pittsburgh and Youngstown sheet mills are from ten days to four weeks in arrears. In New York and New England, carryovers in sheets on June 30 may not exceed two weeks.

REPUBLIC RAISES SIGHTS—General business conditions have improved so sharply in recent months that Republic Steel Corp. has hiked its estimate of 1959 industry output from 110 million to 115 million ingot tons. C. M. White, chairman, thinks his firm may do as well in the fourth quarter as it's doing in the second (operations at 95 per cent of capacity). His estimate of 1960 industry output: 118 million to 120 million tons.

PRODUCTION SETS RECORD—Last week, steelmakers operated their furnaces at 95.5 per cent of capacity and turned out 2,704,000 ingot tons—the largest production in history.

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*Current prices were published in the May 11 issue and will appear in subsequent issues.

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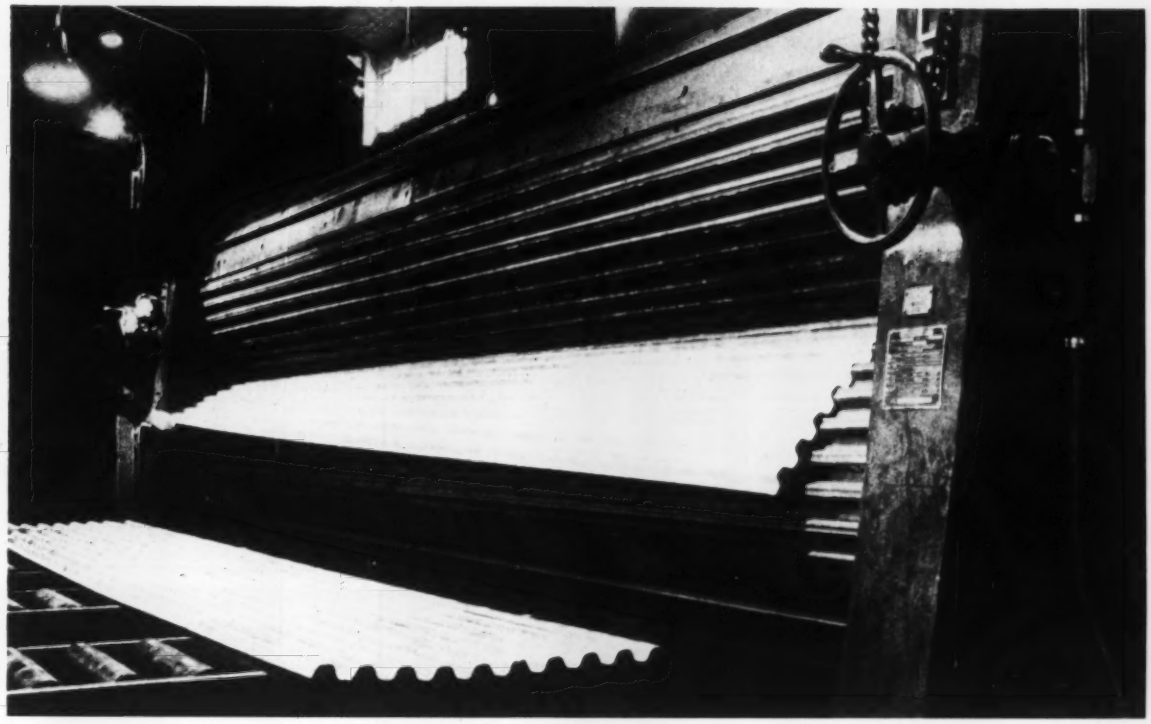


Giant corrugator, with a roll width of 21½ ft, sets theme as . . .

Granite City Steel Shapes Its Future

TWO CONCERTED growth programs since World War II have paid off for Granite City Steel Co., Granite City, Ill., a firm which once had to decide whether to stay in the steel business or get out. Growing into its bigger shoes, Granite City Steel has boosted ingot capacity and production three times faster than the steel industry average.

As one of the smaller U. S. flat rolled producers, Granite City has to compete directly with bigger steelmakers. To do so, it set out to create a single plant large and efficient enough to compete with any multiplant rival. Effectiveness of the programs was proved in 1958. Operating at 88 per cent of capacity, it held its earnings within 6 per cent of 1957's. Near the end of '58, profit margins began to climb back toward the high levels of 1955-56.

• Program one called for heaviest construction between 1951-1953.

Physical growth included installation of a new cold strip mill; purchase and improvement of a nearby merchant blast furnace plant; a boost in open hearth capacity, and replacement of antiquated hot rolling equipment.

At the outset of the program, Granite City's steelmaking capacity stood at 500,000 annual tons—290,000 tons in three wartime open hearths built by the government, 210,000 tons in nine other old open hearths. By 1954, capacity was boosted to 1,080,000 tons in seven large open hearths. (The company bought the three government furnaces and built four new ones.)

• Program two rounded out new plant facilities, enabling the company to increase ingot capacity 47 per cent this year.

Granite City opened phase two of its growth plan in 1955 with a new blast furnace. Since then, the firm has built a new continuous galvanizing line, a new hot coiler for production of wider sheets and plates, and has strengthened the entire cold rolling operation. Capacity to produce cold rolled products has been raised by one third.

Open hearth production is going up. Increased hot metal supply, enlargements, and the greater use of oxygen will boost annual ingot capacity to 1,584,000 tons by the end of this year.

• With basic construction completed, current emphasis is on upgrading finishing departments.

Early expansion gave Granite City a bigger supply of cold rolled steel. Attention is now centered on the tin plate and galvanized sheet departments. A new coil preparation line permits the shipping of tin plate in coil forms. A second electrolytic tin line with 50 per cent

greater capacity than the present line, is under construction to keep up with a brisk demand from can manufacturers.

A major revamping of the continuous galvanizing line last March has increased capacity and improved quality. New equipment includes a coiler at the end of the line and a new furnace. Improvements in the galvanizing line are aimed at eventually bringing the company into production of flat galvanized sheets, although Granite City will remain a major producer of galvanized roofing and siding and corrugated sheets.

• Granite City's finances have improved steadily since the massive outlays for construction in program one.

That period was financed by long term mortgage loans and debentures, by two issues of preferred stock (one since converted to common), and by various short term obligations that have been paid.

Program two, as well as current work on the tin line, will be paid off through retained earnings and depreciation.

Steelmen Concerned Over Rising Tide of Imports

Foreign steel is coming into this country in steady volume. Steelmen in the Great Lakes area are expressing concern over the mounting tide of imports coming in via the St. Lawrence Seaway. A Dutch ship last week arrived at Buffalo with a cargo of used steel rails. A similar shipment arrived the week before.

Most overseas mills are reported promising delivery within three to four months, except on merchant bars, which are on a five-month schedule. One British mill offers delivery in 10 weeks on wide flange beams.

With a strike at steel mills in the U. S. threatening, considerable interest is being shown by consumers in foreign sources of steel, and foreign prices. The following is the current list of prices quoted by Canadian mills:

MILL BASE PRICES
(f.o.b. Hamilton, Ont.)

	Per Net Ton
Blooms, billets, slabs (carbon forging)	$97.00
Blooms, billets, slabs—alloy	115.00
	Per 100 lb
Wire rods, $\frac{7}{32}$ in. to under $\frac{1}{4}$ in.	$5.30
Wire rods, $\frac{1}{4}$ in. to 47/64 in.	5.70
Wire rods, alloy	6.40
Bars & small shapes, merchant quality	5.40
Bars & small shapes, special quality	5.85
Bars & small shapes, alloy	6.40
Bar mill bands	5.40
Bar mill bands, alloy	8.05
Structural angles and zees	5.40
Plates, carbon	5.45
Hot rolled sheets	5.00
Hot rolled strip	5.00
Cold rolled sheets	6.35
Cold rolled strip	6.35
Galvanized sheets, standard quality	6.70
Galvanized sheets, culvert quality	7.00
Galvanized sheets, colorbound	6.60
Enameling sheets	7.45
Electrical sheets and coils	
Field grade	9.00
Armature grade	9.50
Electrical grade	10.15
Common coke tin plate	10.60
Electrolytic tin plate	9.10
Black plate	8.30

Steel Bars . . .

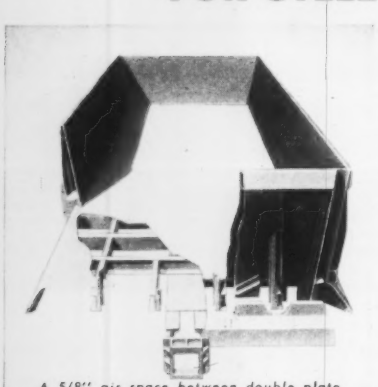
Bar Prices, Page 183

Commercial steel bars are moving at a fast pace, but new orders appear to be less active. Most concern of consumers is over shipments against orders they placed for delivery this quarter. They want to be sure of adequate supplies in event there's a steel strike at the end of June. They also want to protect themselves against possible higher prices.

Most of the tonnage on produc-

MAGOR AIR DUMP CARS

FOR STEEL PLANT SERVICE



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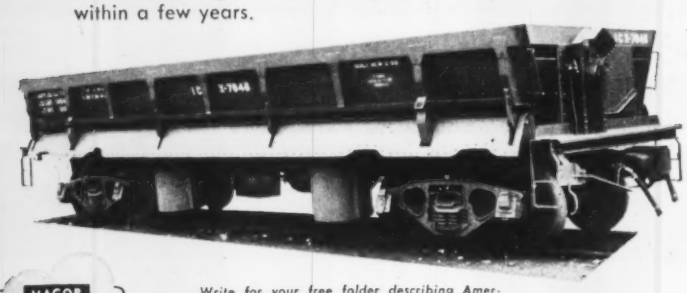

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ers' books will be delivered, but there'll be a little carryover into the third quarter. Defense requirements are expected to be heavier in the second half.

Demand for cold-finished bars continues strong, and producers have little tonnage open for delivery over the rest of this quarter. The few open spots in June books are being filled with orders from customers who need steel for immediate use. Service center demands have picked up markedly but not as much as had been expected. Among the most active buyers are the automotive suppliers, fastener makers, appliance manufacturers, farm and textile machinery builders.

Users are beginning to show interest in the third quarter. Those who can forecast their needs are ordering for July and August. They probably won't need steel before September, but ordering now may assure them of early delivery after a strike. This is not true all around. Some steelmakers have advised customers their deliveries are running four to five weeks late. As a consequence, July will be used as a catch-up month, which means orders specifying July shipment probably won't be rolled as originally scheduled.

Cold finishers say the hot mills are behind schedule on about 20 per cent of the material they've ordered.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 184 & 185

• SHEET order backlogs at Pittsburgh are shrinking as producers continue to ship more tonnage than they're booking. Slowdowns and operational problems have prevented some mills from keeping their delivery commitments. A leading maker says he won't be able to ship May orders until June, and June orders until July.

"We're a month behind on flat rolled," a sales executive comments, "and customers are on our backs because they're using steel faster than they had expected. They don't have enough on hand to maintain production, to say nothing about building a surplus against the strike threat. Since the first of the year, one of our customers has stretched his workweek from 35 to 60 hours."

• **Expect Light Carryovers**—In general, while schedules for the current quarter are filled, most producers' carryovers at the end of June won't run more than two weeks on the major grades of sheets. One eastern mill's carryover won't run much more than a week.

The big question is whether the mills will be able to sustain production the remainder of this quarter. On previous occasions when a strike threatened, sporadic walkouts and slowdowns in the final two weeks of the labor negotiations restricted output.

Sellers are still accepting tonnage for July, but there's still open capacity for that month. However, fair orders are coming in for August and September shipment. Regular customers are coming in for normal third quarter tonnages, but there's no urgency to their ordering. Market analysts at a Pittsburgh mill think third quarter operations will average about 65 per cent of capacity, if there's no strike.

• **Significant Development** — Top "brass" of consuming companies again are pressuring steelmakers for deliveries. Such action hasn't

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been in vogue since steel products went from tight to easy supply several years ago.

One reason for the pressure: Deliveries in the area are running at least four weeks behind on hot rolled and galvanized sheets. The mills are not receiving any cancellations of orders on books, and they're not expecting any.

• **Not Worried**—Appliance manufacturers are consuming substantial tonnage, but do not appear particularly worried about stocks. They think they will have enough to see them through a strike emergency. This is also true of manufacturers of furniture, shelving, and containers. Makers of doorbucks, though, are pressing the mills for more tonnage.

The Quartermasters' Depot, Columbus, Ohio, will close June 2 on 125,000 steel drums (55 gallon) made of 16 gage sheets.

Tin Plate . . .

Tin Plate Prices, Page 185

Tin plate producers figure that April, May, and June shipments will be 35 per cent more than production. They will be cleaned out of stocks by June 30. Consumers have been moving tin plate freely into their plants over the three-month period to avoid the risk of transportation snags likely to be experienced in June.

Distributors . . .

Prices, Page 188

The new system of pricing based on the combined application of item extras and order quantity discounts is gaining followers. It was put into effect at Pittsburgh by Joseph T. Ryerson & Son Inc. at the start of this month (see STEEL, May 18, p. 141).

U. S. Steel Supply Div., U. S. Steel Corp., has taken similar action at Pittsburgh and Cleveland.

Distributors are booking a substantial volume of business, and they expect to do even better before the end of this quarter, especially as the steel strike deadline nears. In some cases they are getting business that would normally go to the mills, but, generally, the service centers are turning away mill-size orders, preferring to hold their stocks for regular customers.

Midwestern observers think a shortage of structurals may be experienced during the second half. Shapes are not usually stocked heavily by fabricators but are ordered to meet the requirements of individual jobs.

Rails, Cars . . .

Track Material Prices, Page 186

The Pennsylvania Railroad has entered a lease agreement with General American Transportation Corp. on 1700 gondolas (52 ft each), to be built at General American's East Chicago plant. Value of the cars will be about $16.5 million.

The cars will be completed this year and will be leased for 20 years, with the railroad having an option to renew for an additional ten years.

The Pennsylvania also has leased 1000 hoppers from the Pullman-Standard Car Mfg. Co., Chicago, and 300 flatcars from the General Steel Castings Corp.

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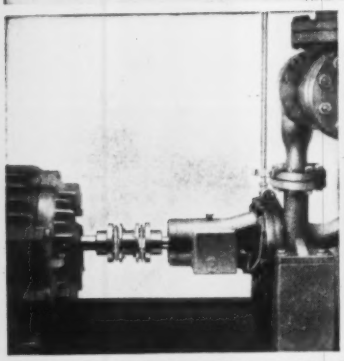

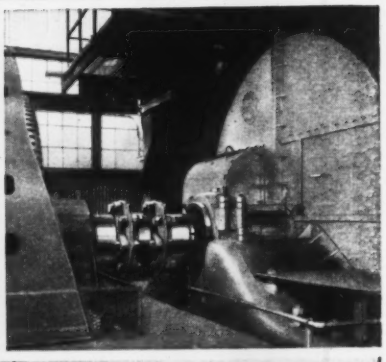

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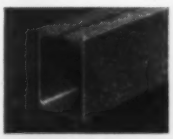

Box girder construction: Two channel sections, welded toe-to-toe, provide a frame far stronger than the ordinary angle or channel frame. This box frame is used under both the sides and ends of the car.

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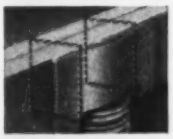

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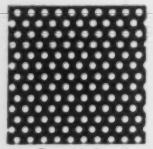

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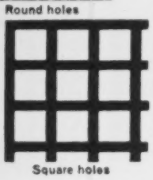
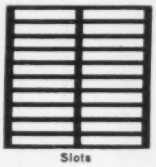
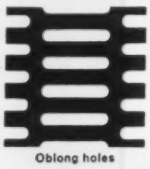


Square holes

Herringbones



Slots



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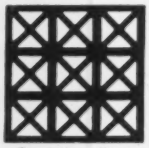

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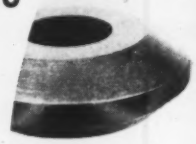

Readily machined—
with standard machine tools.

Quench hardened
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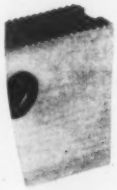
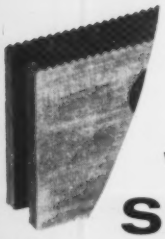
Virtually
no movement in heat treatment.



Eliminates
need for diamond wheels.



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Tubular Goods . . .

Tubular Goods Prices, Page 187

Pittsburgh district mills are sold out for the first half on all tubular products, except drill pipe, standard seamless, and continuous weld. One maker is still taking orders for late June shipment of buttweld (by rail only), but a sales official says he's not sure the mill can get it out.

Although producers are booked up solidly through June on oil country tubing and casing, they aren't entering much business on their books for third quarter. The big oil companies are under no pressure to buy because suppliers won't sell monthly quotas set aside for them without giving ample warning. If a strike is averted, the summer will undoubtedly be a period of inventory reduction.

Demand for line pipe will be substantial the rest of the year, but there are still openings in third and fourth quarter books. It's unlikely any pipeline projects will be seriously delayed by a shortage of steel unless there's a lengthy strike. A leading producer will run 18 in. pipe in June; it has nothing scheduled beyond.

Texas pressure and soil pipe plants are operating at high levels. Oil country goods suppliers are also experiencing an upturn in demand as drilling rises. Hughes Tool Co.'s survey shows the active rig count for the U. S. climbed to a 1959 peak for the sixth straight week. At 2138, the total was four above the previous week's figure and 341 above that in the corresponding week a year ago.

Stainless Steel . . .

Stainless Steel Prices, Page 187

The buying rush in stainless has slowed considerably, but there's still a lot of jockeying for priority on deliveries. Although producers have been shipping at a record pace, they are a week or two behind on deliveries of sheets and strip.

Buyers seem fairly well satisfied with their inventories. Autobuilders warned suppliers early in the year to be prepared for a 90 day steel strike. In other industries, users have enough steel to last about two months.

Steelmakers are solidly booked up for the first half on all products.

Sheets and strip have been sold out for weeks. Because demand reflects heavy consumption as well as inventory building, customers are ordering at a brisk rate for July and August shipment. If a strike is averted, cancellations will be few. Bars were available for late June delivery as recently as two weeks ago; now they're sold out too.

Stainless producers think the fourth quarter may be as good as the second, even though buying won't have the artificial stimulus that strike hedging provides. They look for strong demand from the service centers and from manufactures of restaurant and hospital equipment.

Plates . . .

Plate Prices, Page 183

Military installations are calling for sizable tonnages of plates. One recent award in the Pacific Northwest involved 1000 tons, and several others are pending in that district.

Tank requirements are reported heavier in New England, offsetting to some extent a decline in shipyard buying, except for naval construction. Fabricators of butane tanks, among others, have entered the plate market in the Southwest with substantial orders. Area producers are filling their third quarter order books rapidly.

Order carryovers into third quarter will be substantial, and mill representatives say they do not expect severe cancellations if a strike is averted.

Sheared plate schedules are filled at most mills through the rest of this quarter, and all the tonnage booked for June shipment will not be cleared.

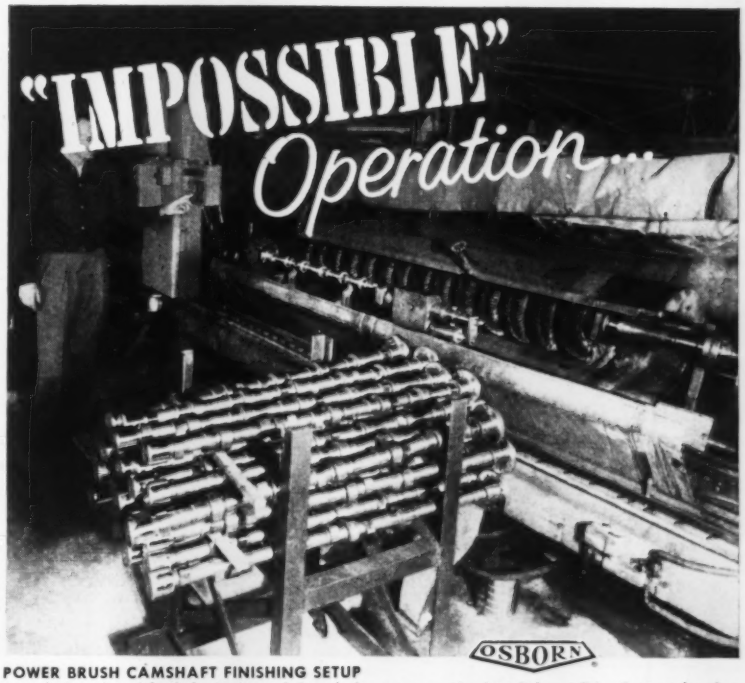
Warehouse distributors anticipate improved demand for plates in event mill production is halted by a strike at midyear.

James Russell Engineering Works Inc., Boston, will fabricate 4600 tons, 30 in. caisson pipe, for the Prudential Tower foundations, Boston. Bethlehem Steel will supply the plates.

Iron Ore . . .

Iron Ore Prices, Page 190

As traffic through the St. Lawrence Seaway increases, larger cargoes of Labrador iron ore are being brought into the Buffalo area. Small



POWER BRUSH CAMSHAFT FINISHING SETUP *was designed and built by Universal Camshaft Co., Muskegon Heights, Michigan. It incorporates lathe bed, air cylinder, 50 hp motor and a gang-unit of 14 Osborn Disc-Center® brushes. Operation deburrs cams and cleans plating chips from steel shafts automatically.*

UNTIL OSBORN POWER BRUSHING tackled this camshaft finishing job

This manufacturer had been finishing steel camshafts by a slow, costly offhand method that resulted in pitted shafts and inconsistent deburring . . . high scrap loss. It looked like an "impossible" operation to improve.

But, today—using this ingenious power brushing method developed by the manufacturer's engineers and an Osborn field specialist—the job is done rapidly, economically with extremely high quality output.

An operator simply loads the steel shaft into a fixture. The Osborn Disc-Center® Brush unit drops against the work at pre-set pressure and time cycle . . . also reciprocates back and forth along the shaft. This action allows deburring cams of various type steel shafts *without* re-spacing the brushing unit. Plating chips are thoroughly cleaned from the main shaft at the same time.

With modern Osborn Power Brushing—this "impossible" job became a high-output, low-cost, quality-controlled operation.

An **O**sborn **B**rushing **A**nalysis—made in your plant at no obligation—can pinpoint new savings and better finishing methods for you, too. Write us for details. *The Osborn Manufacturing Company, Dept. S-8, Cleveland 14, Ohio.*

Osborn Brushes

POWER, PAINT AND MAINTENANCE BRUSHES • BRUSHING METHODS
BRUSHING MACHINES • FOUNDRY PRODUCTION MACHINERY

type canalers, which formerly carried about 2250 tons, are moving up the Buffalo River to Republic Steel Corp.'s works with 4000 tons each. Seven of the vessels arrived recently to get Republic's Labrador ore imports off to a fast start.

The shipments were topped by the arrival of the *Seaway Discoverer* with 6750 tons, the largest cargo brought in at Buffalo by an ocean carrier. The British ship dropped off a portion of her cargo en route so she could conform with Republic's draft requirements.

Steel Use in Aircraft Faces New Competition

Steel, which competes with aluminum as the basic material in high speed aircraft, missiles, and space vehicles, will face increased competition from other metals. That's what L. P. Spalding, chief materials engineer, Los Angeles Div., North American Aviation Co., told a San Francisco meeting of the Commercial Research Committee, American Iron & Steel Institute.

He said titanium, columbium, molybdenum, tantalum, tungsten, beryllium, have strong potential.

North American's B-70 manned bomber may use as much as 50 to 75 tons of steel products, Mr. Spalding said. Steel was selected because of its resistance to high temperatures as well as its structural efficiency.

But, Mr. Spalding warned, the steel industry must make constant metallurgical advances to meet future requirements.

Wire . . .

Wire Prices, Pages 185 & 186

Except for merchant products, most wire buying is for third quarter needs, with delivery depending on production conditions. Many users of industrial grades of wire are entering orders on producers' books to assure themselves of position in mill schedules later this year. Should there be a strike, carryover tonnage will disrupt scheduling to some extent.

Some producers can still accept wire rope orders for June shipment. Converters have built up a 60-day inventory of rods in many cases. A steel strike will not entirely halt wire production for several weeks after it starts. Some smaller wire drawers will continue to operate, depending on the extent of their rod supplies.

Finished Steel Product Shipments—March, 1959

(Net tons)

Products:	Carbon	Alloy	Stainless	1959	1958
Ingots	15,016	13,056	2,224	72,769	72,622
Blooms, etc.	116,634	52,609	1,364	430,385	314,879
Tube rounds	970	242	1	4,577	2,008
Skelp	1,378	.....	.....	12,409	19,889
Wire rods	135,300	4,151	939	341,633	189,857
Structurals	513,479	5,733	12	1,235,610	1,004,246
Steel piling	34,984	.....	.....	89,394	91,913
Plates	604,345	43,508	3,224	1,718,047	1,429,145
Rails—standard	96,729	.....	.....	222,656	146,839
Rails—other	4,600	.....	.....	11,252	9,251
Joint bars	4,144	.....	.....	9,448	11,494
Tie plates	22,292	.....	.....	45,716	33,796
Track spikes	6,190	.....	.....	13,909	11,515
Wheels	21,591	40	.....	51,685	56,168
Axles	11,185	51	.....	22,846	32,474
Bars—hot rolled	645,074	175,979	4,297	2,104,881	1,252,928
Bars—reinforcing	216,829	.....	.....	500,500	365,933
Bars—cold drawn	129,363	23,930	5,980	414,775	243,316
Tool steel	1,146	8,438	.....	24,778	17,973
Standard pipe	249,364	117	.....	622,096	452,435
Oil country goods	214,147	47,129	.....	636,911	315,746
Line pipe	306,889	160	.....	755,974	605,294
Mechanical tubing	58,586	26,552	354	224,073	135,958
Pressure tubing	21,277	4,263	1,043	75,642	68,158
Drawn wire	278,295	4,285	3,347	725,116	513,699
Nails & staples	42,591	.....	2	103,577	93,857
Barbed wire	6,911	.....	.....	15,605	16,060
Woven fence	20,655	.....	.....	45,662	47,455
Bale ties, etc.	5,813	.....	.....	19,137	6,692
Black plate	69,533	.....	.....	178,752	161,141
Tin & terne plate—hot dipped	46,706	.....	.....	101,612	97,700
Tin plate—electro	597,408	.....	.....	1,457,243	1,291,322
Sheets—HR	890,202	30,644	6,660	2,442,180	1,360,706
Sheets—CR	1,536,944	5,509	14,589	4,225,560	2,285,106
Sheets—galvanized	311,961	.....	.....	872,842	550,161
Sheets—other	30,336	.....	.....	82,788	41,074
Electrical sheets & strip	5,561	64,361	.....	177,554	112,258
Strip—HR	149,584	2,836	1,903	387,731	222,316
Strip—CR	110,343	1,815	21,986	358,577	245,291
Total (1959)	7,534,355	515,408	67,925	20,835,902	.....
Total (1958)	4,153,606	259,566	35,354	.....	13,928,675

Data from the American Iron & Steel Institute.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

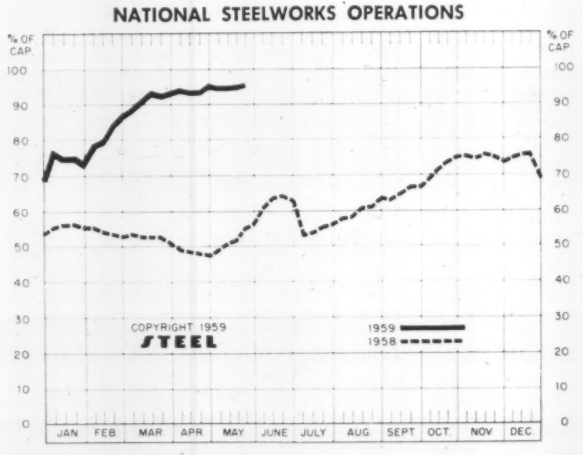
	Week Ended May 24	Change	Same Week 1958	Same Week 1957
Pittsburgh	96.0	+ 1.5*	53	90
Chicago	94.0	+ 1.0	60	88
Eastern	97.0	0	49	94
Youngstown	96.0	0	45	81
Wheeling	94.0	+ 1.0	73.5	84.5
Cleveland	99.5	+ 2.5*	32	84
Buffalo	107.0	+ 2.0	44	52.5
Birmingham	96.0	+ 4.0	67	92.5
Cincinnati	95.5	+ 2.5*	62	80
St. Louis	103.0	+ 2.0	78.5	84.5
Detroit	98.5	— 2.0	47.5	80.5
Western	96.5	0	67	100
National Rate	95.5	+ 0.5	54.5	84

INGOT PRODUCTION‡

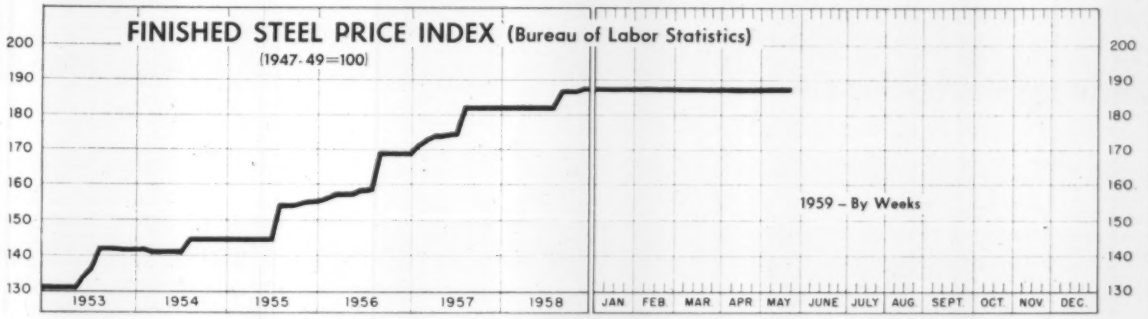
	Week Ended May 24	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	166.5	163.8	164.7	94.8
NET TON (In thousands)	2,674	2,631	2,646	1,523

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



May 19, 1959	Week Ago	Month Ago	April Avg.	Year Ago
186.7	186.7	186.7	186.7	181.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended May 19

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.530
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	27.005
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.665
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.722
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	May 20 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.70
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	33.33	33.33	34.67	33.50	28.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	May 20 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.405
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.65
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate(1.50 lb)box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods ⅜-⅝" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton

	May 20 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$34.50	$34.50	$36.50	$32.50	$30.50
No. 1 Heavy Melt, E. Pa.	33.50	33.50	33.50	34.50	23.00
No. 1 Heavy Melt, Chicago	32.00	32.00	34.00	33.50	31.50
No. 1 Heavy Melt, Valley	35.50	35.50	37.50	36.50	29.50
No. 1 Heavy Melt, Cleve.	33.50	33.50	35.00	33.00	28.50
No. 1 Heavy Melt, Buffalo	31.50	31.50	34.50	28.50	25.50
Rails, Rerolling, Chicago	55.50	55.50	57.50	51.50	42.00
No. 1 Cast, Chicago	47.50	46.50	44.50	40.50	38.50

COKE, Net Ton

Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

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Every time you save $6,400 in your degreasing costs, it is the equivalent of your net on a $100,000 order.

COLUMBIA-SOUTHERN CAN CUT THESE COSTS FOR YOU

Columbia-Southern is a foremost name in degreasing knowledge and experience, product quality, cost-saving operation. Our Technical Service specialists will be glad to examine your degreasing process and recommend ways in which you can effect savings.

SO, WHY WAIT?

If a Columbia-Southern representative has not yet reviewed your degreasing operation, his visit in the near future will more than likely save you money. So, why wait? Write today to "Trichlor" at our Pittsburgh address.

*Based on Manufacturing Corporation Statistics for the first half of 1958.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

Subsidiary of Pittsburgh Plate Glass Company • One Gateway Center, Pittsburgh 22, Pennsylvania

Steel Prices

Mill prices as reported to STEEL, May 20, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 184; footnotes; page 186.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$76.00

INGOTS, Alloy (NT)
Detroit S41 .....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 ....82.00
Midland Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ..$82.00
Bessemer,Pa. U5 .....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 .....80.00
Ensley,Ala. T2 .....80.00
Fairfield,Ala. T2 .....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2 ..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 .....80.00
Youngstown R2 .....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 .....99.50
Canton,O. R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3 ..104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 .....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 ....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2 ..99.50
LosAngeles B3 .....109.00
Midland,Pa. C18 .....99.50
Munhall,Pa. U5 .....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 .....109.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14 .99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 .....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 .....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ..140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 .....130.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky G8 ....119.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14 .119.00
S.Duquesne,Pa. U5 ..119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 .....122.50

SKELP
Aliquippa,Pa. J5 .....5.05
Munhall,Pa. U5 .....5.05
Pittsburgh J5 .....5.05
Warren,O. R2 .....5.05
Youngstown R2, U5 ....5.05

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
N.Tonawanda,N.Y. B11..6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14 .6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 .....5.50
Atlanta A11 .....5.70
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1 5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 .....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14 ..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 ....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 .....5.50
Sterling,Ill. N15 .....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1.8.05
Johnstown,Pa. B2 .....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05
Sterling,Ill. N15 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
S.Chicago, Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ...5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 .....5.30
Cleveland J5, R2 .....5.30
Coatesville,Pa. L7 .....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30)K1 ..6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1.5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 .....5.30
Youngstown (27) R2 ..5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....7.05
Fontana,Calif. K1 .....7.85
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairton,Pa. U5 .....7.95
Claymont,Del. C22 .....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 .....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1. 7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14 ..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 .....7.95

PLATES, Alloy
Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 .....7.50
Coatesville,Pa. L7 .....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 .....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 .....7.50

FLOOR PLATES
Cleveland J5 .....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ....6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
S.Chicago,Ill. U5 .....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 .....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 .....5.875
Atlanta(9) A11 .....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O. (23) R2 ....6.15
Clairton,Pa.(9) U5 ..5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich.(9) G5 ....5.675
Emeryville,Calif, J7 ...6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
LosAngeles(9) B3 .....6.375
Massillon,O. (23) R2 ..6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
N.T'wan'a,N.Y.(23)B11 6.025
Owensboro Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11.6.375
Pittsburgh(9) J5 .....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle A24, B3, N14 ..6.425
S.Ch'e'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ...5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11.6.375
Warren,O. C17 .....6.025
Youngstown(9) R2, U5..5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.725
Bethlehem,Pa. B2 .....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 .....6.725
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 .....7.775
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 .....6.725
KansasCityMo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 .....7.775
Lowellville O. S3 .....6.725
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 .....6.725
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 .....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9)S5 ..5.925
Lackawanna(9) B2 .....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ...5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 .....6.52
Seattle B3 .....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 .....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

BARS, C.F. Leaded (Including leaded extra) Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ...10.175
BeaverFalls,Pa. M12 ..10.175
Camden,N.J. P13 .....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. S17 .....10.175
Newark,N.J. W18 .....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2 .7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 .....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O. W8 .....7.65
FranklinPark,Ill. N5 ...7.65
Gary,Ind. R2 .....7.65
GreenBay,Wis. F7 .....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 .....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2..9.10
Mansfield,Mass. B2 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 .....7.90
Putnam,Conn. W18 .....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 .....7.65
SpringCity,Pa. K3 .....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Waukegan,Ill. A7 .....7.65
Willimantic,Conn. J5 ....8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.625
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 .....9.025
Bridgeport,Conn. C32..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O. T7 .....9.025
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 .....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O. W8 .....9.025
FranklinPark,Ill. N5 ...9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 .....9.025
Hammond,Ind. J5, L2 ..9.025
Hartford,Conn. R2 .....9.325
Harvey,Ill. B5 .....9.025
Lackawanna,N.Y. B2 ..9.025
LosAngeles P2, S30 ...11.00
Mansfield,Mass. B5 ....9.325
Massillon,O. R2, R8 ....9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 .....9.225
S.Chicago, Ill. W14 .....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ....9.325
Worcester,Mass. A7 ....9.325
Youngstown F3, Y1 ....9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 ....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 ....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ...5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4)F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ...6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 .....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 ....7.525
Ashland,Ky. A10 ....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 ....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 ....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 ....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ...6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ...6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 ....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 ....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div., U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.

C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.
D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.
N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala., T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackaw'na,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle(25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41, Y1	17.425

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12 90	15.90	18.85
Boston T6	9.50	10.70	12 90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12 60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C. R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41	7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)

IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American

	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif.K1	11.06	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	....	19.70	20.20	20.70
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70
Warren,O. R2	....	....	....	....	....	....
						15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngeles B3	8.95
Minnequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
N.Tonawanda,N.Y. B11	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
New Haven,Conn. A7	10.05
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers O. Y1	9.75
Trenton,N.J. A7	9.75
Waukegan Ill. A7	9.75
Worcester,Mass. A7, J4, T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE (A)

Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N. J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity, Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S. Chicago,Ill. R2	173
SparrowsPt. Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) To Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
Sparrows Pt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S. Chicago, Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
PittsburgCalif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	9.00 9.55**
Aliquippa J5	8.65 9.325§
Atlanta(48)A11	9.10 9.775§
Bartonville(48) K4	9.10 9.80
Buffalo W12	9.00 9.55†
Cleveland A7	9.00 ....
Crawfordsville M8	9.10 9.80‡‡
Donora,Pa. A7	9.00 9.55†
Duluth A7	9.00 9.55†
Fairfield T2	9.00 9.55†
Houston(48) S5	9.25 9.80**
Jack'ville,Fla. M8	9.10 9.80‡‡
Johnstown(48) B2	9.00 9.675§
Joliet,Ill. A7	9.00 9.55†
Kans.City(48) S5	9.25 9.80**
Kokomo(48) S16	9.10 9.65†
LosAngeles B3	9.95 10.625§
Monessen(48) P7	8.65 9.35§
Palmer,Mass. W12	9.30 9.85†
Pitts.,Calif. C11	9.95 10.50†
Rankin,Pa. A7	9.00 9.55†
S.Chicago R2	9.00 9.55**
S.SanFran. C10	9.95 10.50**
Spar'wsPt.(48)B2	9.10 9.775§
St'ling(1)(48)N15	9.00 9.70§§
Struthers,O. Y1	9.00 9.65†
Worcester,Mass.A7	9.30 9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
3 in. and shorter .. 55.0
3¼ in. thru 6 in. .. 50.0
Longer than 6 in. .. 37.0
⅝ in., 3 in. & shorter 47.0
3¼ in. thru 6 in. .. 40.0
Longer than 6 in. .. 31.0
⅞ in. thru 1 in.:
6 in. and shorter .. 37.0
Longer than 6 in. .. 31.0
1¼ in. and larger:
All lengths 31.0
Undersize Body (rolled thread)
½ in. and smaller:
3 in. and shorter .. 55.0
3¼ in. thru 6 in. .. 50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)
½ in. and smaller:
6 in. and shorter .. 48.0
Larger diameters and longer length .. 35.0

Lag, Plow, Tap, Blank Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:
6 in. and shorter .. 48.0
Larger diameters and longer lengths .. 35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)
⅝ in. diam 50.0
⅞ in. diam 47.0
⅞ and 1 in. diam. 43.0
1⅛ and 1¼ in. diam 34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:
All sizes 56.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:
¾ in. and smaller.. 62.0
⅞ in. to 1½ in., incl. 56.0
1⅝ in. and larger .. 51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):
¾ in. and smaller.. 62.0
⅞ in. to 1½ in. incl. 56.0
1⅝ in. and larger 51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):
⅞ in. and smaller.. 65.0
1 in. to 1½ in., incl. 57.0
1⅝ in. and larger.. 51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):
⅝ in. and smaller.. 62.0
¾ in. to ⅞ in., incl. 65.0
1 in. to 1½ in., incl. 57.0
1⅝ in. and larger.. 51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:
⅝ in. and smaller.. 35.0
¾, ⅞, and 1 in. .. 16.0
Longer than 6 in.:
⅝ in. and smaller.. 3.0
¾, ⅞, and 1 in. ..+11.0

High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller.. 20.0
¾, ⅞, and 1 in. ..+ 5.0
Longer than 6 in.:
⅝ in. and smaller..+19.0
¾, ⅞, and 1 in. ..+39.0

Flat Head Cap Screws:
¾ in. and smaller, 6 in. and shorter ..+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:
6 in. and shorter ..+ 5.0
Longer than 6 in. ..+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.85, ⅞ in. and smaller by 6 in. and shorter: 15.0%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2½	12	49.24	57.72	43.70
2¾	12	54.23	63.57	48.13
3	12	58.73	68.83	52.13
3½	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.235c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	H.R. Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates: Carbon Base 5%	10%	15%	20%	Sheets: Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base: Cold Rolled 10%	Cold Rolled Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	W Hot Wk. (H-21)	1.425-1.44
Oil Hardening (O-1)	0.505	V-Cr Hot Work (H-13)	0.550
V-Cr Hot Work (H-11)	0.500	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa. deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

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Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill. Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St.. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt.. Matilda, Pa., Portsmouth, Ohio. Hawstone, Pa., St. Louis, $168; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif. $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

*—9 in x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.50-13.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00†

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content: mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe:	
Minimum trucklots, freight allowed east of Mississippi River:	
100 mesh, 100 lb bags	11.25
100 mesh, 100 lb pails	9.10‡
40 mesh, 100 lb bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.50-51.00†
Bronze, 5000-lb lots	52.40-56.40†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	53.00-57.30†
Phosphor-Copper, 5000-lb lots	64.80
Copper (atomized) 5000-lb lots	45.30
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten: Carbon reduced, 98.8% min, minus 65 mesh	Dollars nom.**
1000 lb	2.80
Less 1000 lb	2.95
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scrafing grade. **Depending on price of ore. ††Welding grade.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.31
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearney, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.40	$5.40	$5.30	$5.75
Bar Size Angles	5.10	5.10	5.00	5.43
Structural Angles	5.10	5.10	4.90	5.43
I-Beams	5.11	5.11	5.01	5.45
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.20	6.15	6.05	6.51
Sheets, H.R.	8.30	8.30	8.30	8.60
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.55	6.55	6.55	6.90
Merchant Bars	...	...	5.20	5.65
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.19	5.32	5.14	5.49
Wire Rods, O.H. Cold Heading Quality No. 5	5.09	6.22	6.04	6.34
Bright Common Wire Nails (‡)	7.65	7.65	7.65	7.95

†Per 82 lb net reel. ‡Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade	*14.75*

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

Scrap Market Is Still in Slump

STEEL's composite on No. 1 heavy melting holds steady at $33.33, but price test is lacking at most consuming points. Bids on monthend auto lists awaited

Scrap Prices, Page 194

• **Pittsburgh** — Brokers were encouraged last week when a mill bought 15,000 to 20,000 tons of scrap at the same prices it paid last month: $39 for No. 1 dealer bundles, and $26 for No. 2 bundles. Generally, it's thought prices are on bottom, but the trade doesn't expect an upturn until fall. The mills are currently buying only what they'll need to support operations the rest of this quarter.

• **Chicago**—Scattered sales suggest that some open hearth grades of scrap may be stronger by $1 a ton, yet there are sufficient offerings at current prices to serve as a counter influence. Transactions are limited, and tonnage involved is small. A better appraisal of the market will be afforded in about a week after bids close on several industrial lists. A strong influence in the bidding will be the uncertainty of consumers accepting scrap shipments in June because of a possible steel strike. Some mills have already indicated they will accept no shipments after June 15. With foundry operations improving, and scrap consumption up, the cast iron grades have advanced $1 a ton.

• **Philadelphia** — Domestic demand is virtually nil, but export business is increasing. Some prices changed this week. Short shoveling turnings are quoted at $21-$22, machine shop turnings, $20, and heavy breakable cast, $42. Dealers are watching the steel labor negotiations and don't expect much change in business conditions until the issue is settled.

• **New York**—There's enough activity in the market to sustain brokers' buying prices on grades. Slow yard collections and fair export demand have tended to offset light domestic buying.

U. S. Steel Corp., Bethlehem Steel Co., and Alan Wood Steel Co. have received a proposal aimed at increasing utilization of dealer scrap, particularly No. 2 bundles.

The proposal, made by the New York and New Jersey chapters of the Institute of Scrap Iron & Steel, contemplates formation of a co-operative group of dealers to assure the movement of quality scrap in volume sufficient to make it attractive for the steel mills to replace pig iron with scrap in their steel melts.

• **Cleveland** — The market tone seems a little stronger, largely because dealers and brokers think prices have about reached bottom. They have held unchanged here and in the Valley the last couple of weeks. However, a buying test has been lacking. Expectations are larger tonnage will be offered in the

(*Please turn to Page* 193)

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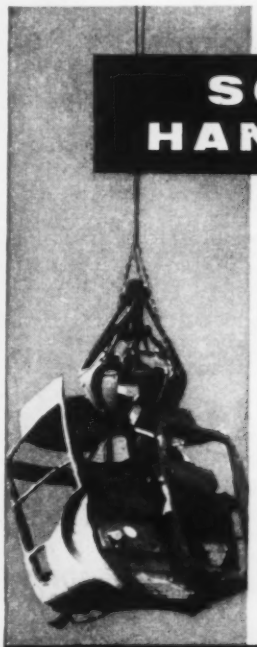

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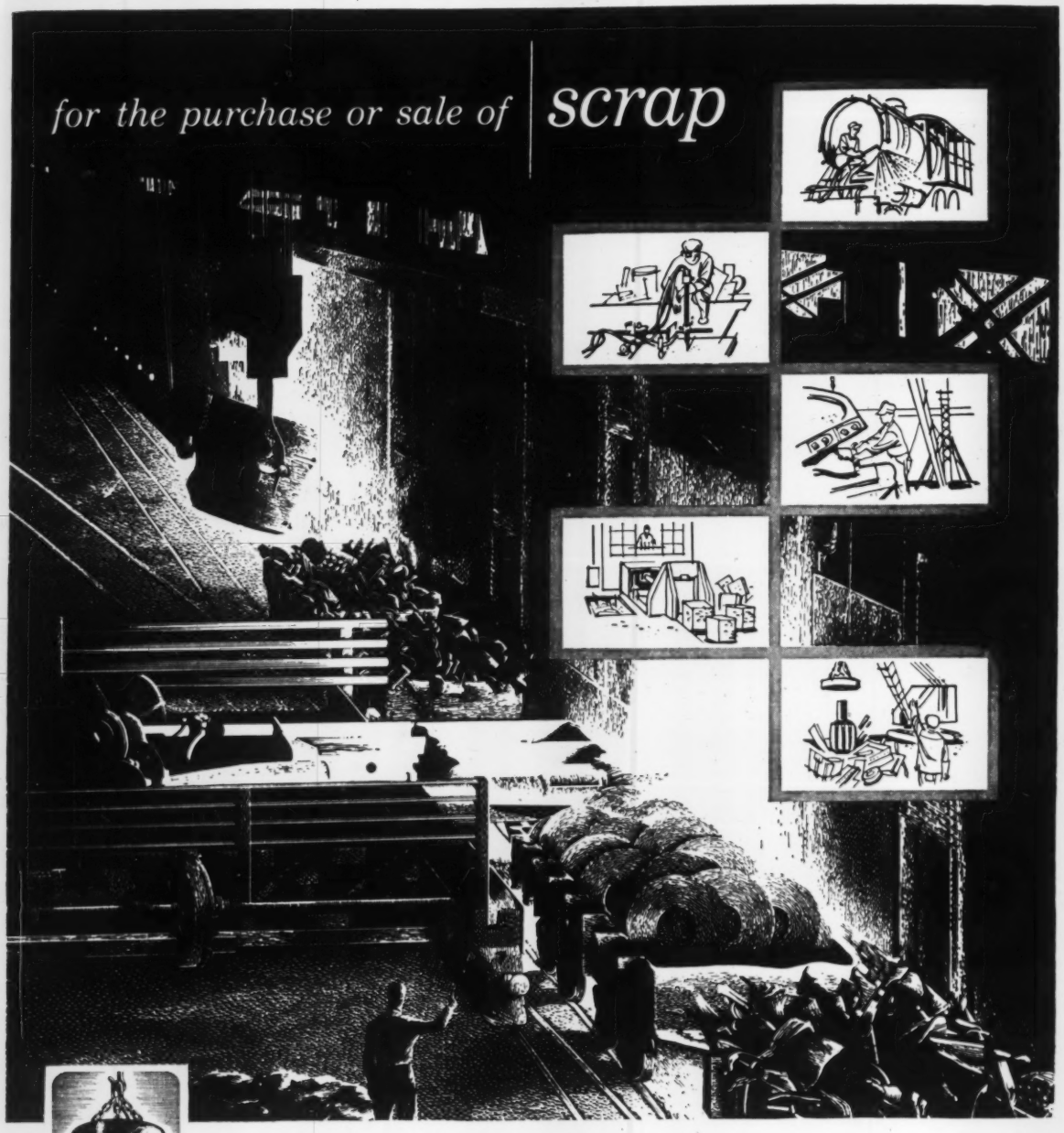

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(*Concluded from Page 191*)

auto lists at the end of this month. Some observers expect active bidding on these lists, and some think bid prices may be up $1 or so from a month ago.

• **Detroit** — The market appears steady, but dealers think prices will skid next month. Yard inventories are dwindling, however, with steel mill operations being maintained at high level. Some observers think bids on the auto lists at the end of this month will be off $2 to $3 a ton. One dealer in the area thinks there'll be a slight increase.

A couple of deals are pending, and they may result in some change in prices. A local broker is offering 20,000 tons of domestic pig iron to scrap dealers. The iron is reportedly held in the Youngstown district.

• **Boston**—Steel scrap prices are at the lowest point this year; brokers are paying $24 for No. 1 heavy melting. Turnings are also quoted lower. Shipments to the steel mills are virtually nil. There's some export business, but buying is light due to accumulations at docks. Foundry grades of scrap are unchanged.

• **Buffalo**—A decline of $2 a ton in cast scrap prices highlighted the market here last week. Foundries paid $45 for cupola cast, and No. 1 machinery cast went off $2 a ton to $49. The steel grades held unchanged, but the market tone is soft. Mills are melting scrap steadily, but they have sizable reserves.

• **Cincinnati**—Prices are steady despite the dull market. Some observers note a stronger undertone, but there has been no buying to provide a test. Brokers are having difficulty filling old mill orders. One mill is expected to enter the market for fair tonnages for June shipment.

• **St. Louis**—Trading is thin, the mills buying sparingly. Prices are firm, with supplies showing little change. Clean auto cast is up $1 a ton, while random length rails are quoted off $1.

• **Birmingham**—The Atlanta mill last week bought No. 2 heavy melting scrap at $2 a ton under its last purchase. Brokers have cut all heavy melting grades, except No. 2 bundles, which grade is now quoted on the same level as No. 2 heavy melting. It's thought the market is now on bottom. Cast iron scrap demand is better, but prices are unchanged.

• **Houston** — Brokers think prices have bottomed out. Seasonal factors and low prices are throttling tonnage movement.

Mill orders that were placed for shipment through June 15 have been covered by brokers. Both Texas steel mills are not expected to do any significant buying this summer, even if a steel strike is avoided. The mill at Lone Star will not be affected immediately by a strike because its contract runs until Sept. 7.

Only sporadic export buying is being done. Scattered Louisiana quotations place No. 1 heavy melting at $31-$32. Brokers working on a Mexican mill order are having difficulty covering because of the slowdown in country scrap generation.

• **San Francisco**—The steel scrap market tone is soft, but prices are holding. It's rumored that third quarter tonnage has been canceled by Japanese buyers. Domestic mills are consuming scrap in large volume, but so far inventories have been little more than dented.

• **Seattle**—Dealers report little material is being generated in the country, and receipts are light. Larger consumers hold substantial inventories, and they are not disposed to add to stocks in the face of a possible shutdown at midyear. Foreign commitments have been completed, and Japan shows no indication of buying additional tonnage.

Structural Shapes . . .

Structural Shape Prices, Page 183

American Bridge Div., U. S. Steel Corp., Pittsburgh, has booked 44,000 tons of structurals for a 55 story, 2.4 million sq ft office building, to be built by Grand Central Building Inc., New York, on a 3½ acre site adjoining Grand Central Terminal. The award was made through Diesel Construction Co., general contractor.

The building will cost $100 million, reportedly the largest sum

(*Please turn to Page 199*)

COVERED HOT TOP BRICK
INGOT MOLD PLUGS

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FIRE BRICK WORKS
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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, May 20, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

May 20	$33.33
May 13	33.33
Apr. Avg.	34.96
May 1958	33.21
May 1954	28.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	*30.00-31.00*
No. 1 dealer bundles	*38.00-39.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	34.00-35.00
No. 1 factory bundles	42.00-43.00
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals:	
2 ft and under	43.00-44.00
3 ft lengths	42.00-43.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	43.00-44.00
Electric furnace bundles	42.00-43.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	45.00-46.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	*39.00-40.00*
Rails, 2 ft and under	54.00-55.00
Rails, 18 in. and under	55.00-56.00
Random rails	48.00-49.00
Angles, splice bars	*48.00-49.00*
Railroad specialties	47.00-48.00
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	220.00-225.00
18-8 turnings	115.00-120.00
430 bundles & solids	120.00-125.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	33.00-34.00
No. 1 hvy melt., dealer	30.00-31.00
No. 2 heavy melting	27.00-28.00
No. 1 factory bundles	37.00-38.00
No. 1 dealer bundles	31.00-32.00
No. 2 bundles	21.00-22.00
No. 1 busheling, indus.	33.00-34.00
No. 1 busheling, dealer	30.00-31.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Cut structurals, 3 ft	40.00-41.00
Punchings & plate scrap	41.00-42.00

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Stove plate	*44.00-45.00*
Unstripped motor blocks	*39.00-40.00*
Clean auto cast	*54.00-55.00*
Drop broken machinery	*54.00-55.00*

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	57.00-58.00
Rails, 2 ft and under	52.00-53.00
Rails, 18 in. and under	53.00-54.00
Angles, splice bars	46.00-47.00
Axles	*62.00-63.00*
Rails, rerolling	55.00-56.00

Stainless Steel Scrap

18-8 bundles & solids	210.00-215.00
18-8 turnings	110.00-115.00
430 bundles & solids	*115.00-120.00*
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	26.00-27.00
No. 1 busheling	35.00-36.00
No. 1 bundles	35.00-36.00
No. 2 bundles	23.00-24.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos	38.00-39.00
Electric furnace bundles	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00

CLEVELAND

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	24.00-25.00
No. 1 factory bundles	37.00-38.00
No. 1 bundles	33.00-34.00
No. 2 bundles	24.00-25.00
No. 1 busheling	33.00-34.00
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	35.00-36.00
Cut structurals, plates 2 ft and under	42.00-43.00
Low phos, punchings & plate	34.50-35.50
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	34.50-35.50

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	33.00-34.00
Brake shoes	36.00-37.00
Clean auto cast	50.00-51.00
Burnt cast	37.00-38.00
Drop broken machinery	50.00-51.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	115.00-125.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*33.00*
No. 2 heavy melting	31.00
No. 1 bundles	37.00
No. 2 bundles	*21.00*
No. 1 busheling	37.00
Machine shop turnings	*12.50*
Short shovel turnings	*14.00*

Cast Iron Grades

No. 1 cupola	49.00
Charging box cast	42.00
Heavy breakable cast	40.00
Unstripped motor blocks	41.00
Clean auto cast	*50.00*
Stove plate	45.50

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Rails, 18 in. and under	49.00
Rails, random lengths	*41.50*
Rails rerolling	52.00†
Angles, splice bars	44.00†

BIRMINGHAM

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*21.00-22.00*
No. 1 bundles	*28.00-29.00*
No. 2 bundles	21.00-22.00
No. 1 busheling	*28.00-29.00*
Cast iron borings	14.00-15.00
Machine shop turnings	20.00-21.00
Short shovel turnings	21.00-22.00
Bars, crops and plates	38.00-39.00
Structurals & plates	*38.00-39.00*
Electric furnace bundles	34.00-35.00
Electric furnace:	
2 ft and under	33.00-34.00
3 ft and under	32.00-33.00

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18 in. and under	48.00-49.00
Rails, rerolling	52.00-53.00†
Rails, random lengths	40.00-41.00
Angles, splice bars	42.00-43.00

PHILADELPHIA

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	36.00-37.00
No. 2 bundles	21.00-22.00
No. 1 busheling	35.00-36.00
Electric furnace bundles	38.00-39.00
Mixed borings, turnings	20.00†
Short shovel turnings	*21.00-22.00*
Machine shop turnings	*20.00*
Heavy turnings	32.00-33.00
Structurals & plate	40.00-42.00
Couplers, springs, wheels	42.00-43.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	*42.00*
Drop broken machinery	49.00-50.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	26.00-27.00
No. 2 bundles	15.00-16.00
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00
Short shovel turnings	13.00-14.00
Low phos. (structurals & plates)	35.00-36.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	26.00-27.00
No. 1 bundles	31.00-32.00
No. 2 bundles	21.00-22.00
No. 1 busheling	31.00-32.00
Mixed borings, turnings	18.00-19.00
Machine shop turnings	16.00-17.00
Short shovel turnings	20.00-21.00
Cast iron borings	18.00-19.00
Low phos structurals and plate, 2 ft and under	41.00-42.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*44.00-45.00*
No. 1 machinery	*48.00-49.00*

Railroad Scrap

Rails, random lengths	43.00-44.00
Rails, 3 ft and under	49.00-50.00
Railroad specialties	41.00-42.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.50-32.50
No. 2 heavy melting	26.50-27.50
No. 1 bundles	31.50-32.50
No. 2 bundles	20.00-21.00
No. 1 busheling	31.50-32.50
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	17.00-18.00
Cast iron borings	16.50-17.50
Low phos., 18 in.	40.00-41.00

Cast Iron Grades

No. 1 cupola	43.00-45.00
Heavy breakable cast	39.00-40.00
Charging box cast	38.00-39.00
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	53.00-54.00
Rails, random lengths	46.00-47.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	20.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	41.00

Cast Iron Grades

No. 1 cupola	43.00
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*24.00*
No. 2 heavy melting	20.00-20.50
No. 1 bundles	24.00-24.50
No. 1 busheling	24.00-24.50
Machine shop turnings	8.00-9.00
Short shovel turnings	10.00-11.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	18.00-19.00
No. 1 bundles	30.00-31.00
No. 2 bundles	17.00-18.00
No. 1 busheling	28.00-29.00
Machine shop turnings	10.00-11.00
Mixed borings, turnings	11.00-12.00
Short shovel turnings	11.00-12.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	30.00-31.00
Charging box cast	31.00-32.00
Heavy breakable	31.00-32.00
Unstripped motor blocks	19.00-20.00
Clean auto cast	43.00-44.00

SEATTLE

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	27.00†
No. 2 bundles	21.00
Machine shop turnings	17.00
Mixed borings, turnings	17.00
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	35.00
No. 2 bundles	*18.00*
Machine shop turnings	*17.00*
Shoveling turnings	*19.00*
Cast iron borings	*19.00*
Cut structurals and plate 1 ft and under	49.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	34.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory: Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

†Nominal.
‡F.o.b. Hamilton, Ont.

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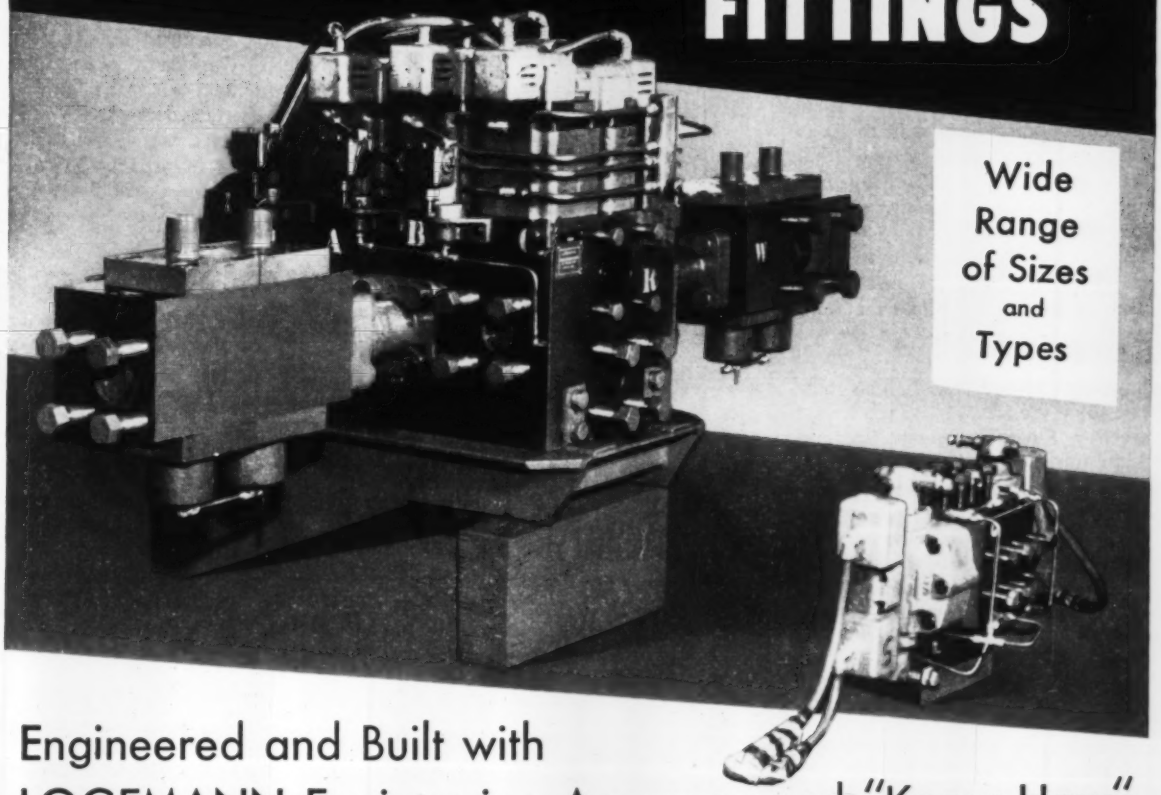

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Aluminum Output Increasing

Primary production is headed for a record year as firms step up operations to keep pace with rising sales. Lead and zinc demand up. Copper may be more stable in future

Nonferrous Metal Prices, Pages 198 & 199

UNLESS some calamity of titanic proportions hits our economy this year, busy potlines at U. S. primary aluminum refiners will churn out a record number of tons.

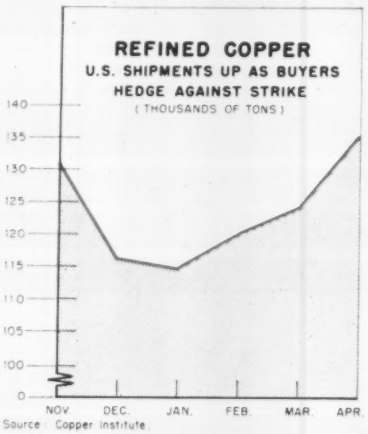
• **The Amount**—Earlier in the year industry spokesmen predicted 1959 production would hit an all-time high of 1.9 million tons. While first quarter output came to only 456,013 tons (or an annual rate of 1,714,052 tons), it now looks like the estimate will be met and possibly surpassed.

Here's why: Primary producers have steadily increased their output since the first of the year. Just recently Reynolds Metals Co. and Aluminum Co. of America announced they are starting up potlines with a combined yearly capacity of 70,000 tons. STEEL estimates these increases have upped current operations to an annual rate of 1,933,250 tons.

• **More**—Look for output to rise even more as the year progresses. Not only are idle lines being reactivated, but a total of 270,000 tons of new production will be in operation by yearend. At this moment it appears the only factor that could put the brakes on production would be a lengthy labor walkout. (Consensus: It's not likely.)

Production is spurting because new orders are pouring in faster than anticipated, and the trend is expected to continue. Producers report they've been pushed hard to meet demand in some items, particularly sheets and extrusions.

• **Still Too Much**—Even with the step up in demand, the industry has excess capacity, and 150,000 additional tons will come on stream next year. The industry's announced plan is to keep capacity several steps ahead of demand so potential users won't shy away because of shortage fears. There's plenty of raw material (bauxite reserves have risen over 50 per cent since 1950) and electrical generation capacity to meet this goal.



Marketing men don't want the supply-demand scale to get too much out of balance though. That's why even more dollars are being channeled into research and development budgets. Aluminum Co. of America, for example, says it will spend over $18 million on R&D this year. Breakdown: $9 million for process and production development, $6 million for improvement in equipment and manufacturing methods, and the remainder for exploration.

Copper Market Stabilizing

The violent price fluctuations that have plagued copper in the past may crop up less often in the future. Reason: Years of exploration and development of new properties are resulting in greater availability.

Simon D. Strauss, vice president of sales for American Smelting & Refining Co., makes this case for copper's problem: Copper is a mining industry as opposed to aluminum and steel, which are basically processing industries. So copper capacity is tied to the discovery of ore bodies.

Lead, Zinc Sales Strong

Demand for both lead and zinc is good. In the case of lead, this is due to better consumption, plus some buying for inventory as a hedge against a possible summer strike. Fewer scrap offerings have sent buyers who normally purchase scrap to the primary producers for their metal. All those factors add up to the strong possibility that the lead price will rise another 0.5 cent to 12.5 cents a pound. That was the opinion of nonferrous prognosticators as STEEL went to press.

Zinc sales are surprisingly good considering some of the steel people are beginning to buy less metal in anticipation of labor difficulties. The price looks stable until labor negotiations are concluded. If there's no steel strike, watch for the price to shoot up.

NONFERROUS PRICE RECORD

	Price May 20	Last Change	Previous Price	Apr. Avg	Mar. Avg	May, 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.000
Copper	31.50–32.00	Apr. 30, 1959	31.50–32.50	32.404	32.031	24.433
Lead	11.80	May 7, 1959	11.30	10.992	11.238	11.512
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	103.25	May 15, 1959	103.125	102.490	108.000	94.510
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld, St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.

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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $177 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 32.00; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 41.00 per gram; 1-10 kg, 37.00 per gram; intrinsic grade, 35.00-37.00 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 100 lb, $11 per lb; 100-500 lb, $9.50 per lb; 500 lb or more, $9 per lb. All prices deld.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $245-249 per 76 lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $2.00-2.20 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 103.25.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 13.50; No. 2, 14.00; No. 5, 13.75 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.875-26.25; No. 12 foundry alloy (No. 2 grade), 22.75-23.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 26.25-27.00; 108 alloy, 23.25-23.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.50; grade 3, 21.25; grade 4, 20.75.

Brass Ingot: Red brass No. 115, 30.25; tin bronze, No. 225, 41.25; No. 245, 35.00; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.50-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.80	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 24.50-25.00; No. 2 heavy copper and wire, 22.50-23.00; light copper, 20.50-21.00; No. 1 composition red brass, 19.00-19.50; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 31.50c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	55.63b	52.86c	....	55.82	27.500	27.500	26.750
Yellow Brass	48.24	32.73d	48.78	51.65	20.625	19.750	18.750
Low Brass, 80%	51.23	51.17	51.77	54.54	23.250	23.000	22.500
Red Brass, 85%	52.29	52.23	52.83	55.60	24.250	24.000	23.500
Com. Bronze, 90%	53.90	53.84	54.44	56.96	25.125	24.875	24.375
Manganese Bronze	56.54	50.14	60.62	....	19.125	18.875	18.375
Muntz Metal	50.85	46.16	....	....	19.375	19.125	18.625
Naval Brass	52.80	46.61	59.36	56.21	19.125	18.875	18.375
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	63.82	66.15	66.15	....	25.500	25.250	12.625
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 18.00-18.50; new brass clippings, 17.50-18.00; light brass, 13.00-13.50; heavy yellow brass, 14.00-14.50; new brass rod ends, 15.00-15.50; auto radiators, unsweated, 14.50-15.00; cocks and faucets, 15.50-16.00; brass pipe, 15.50-16.00.

Lead: Soft scrap lead, 7.75-8.25; battery plates, 2.25-2.50; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.50-10.00.

Monel: Clippings, 26.00-28.00; old sheets, 23.00-25.00; turnings, 20.00-21.00; rods, 26.00-28.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 38.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 9.75-10.25; clean borings and turnings, 6.25-6.75; segregated low copper clips, 13.00-13.50; segregated high copper clips, 13.00-13.50; mixed low copper clips, 12.00-12.50; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.75-12.25; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.75-17.25; segregated high copper clips, 15.75-16.25; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.25-15.75.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.50-11.00; clean borings and turnings, 9.50-10.00; segregated low copper clips, 14.50-15.00; segregated high copper clips, 13.00-13.50; mixed low copper clips, 13.50-14.00; mixed high coppel clips, 12.50-13.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 27.75; No. 2 heavy copper and wire, 26.50; light copper, 24.25; refinery brass (60% copper) per dry copper content, 26.00.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 27.75; No. 2 heavy copper and wire, 26.50; light copper, 24.25; No. 1 composition borings, 21.00; No. 1 composition solids, 21.50; heavy yellow brass solids, 16.00; yellow brass turnings, 15.00; radiators, 17.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 40.50, 2000-5000 lb lots; cast, 43.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; wire, 27.00; No. 2 heavy copper and wire, 26.00; light copper, 23.75; refinery brass deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 80.10; 100-600 lb, 70.70; 700-1900 lb, 68.00; 2000-9900 lb, 66.10; 10,000 lb or more, 64.80.

Stannous Chloride (Anhydrous): 25 lb, 155.60; 100 lb, 150.70; 400 lb, 148.30; 800-19,900 lb, 107.40; 20,000 lb or more, 101.30.

Stannous Sulphate: Less than 50 lb, 140.70; 50 lb, 110.70; 100-1900 lb, 108.70; 2000 lb or more, 106.70.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 193*)

ever expended for an office building.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 184

Bids are in at Ephrata, Wash., for the proposed Wanapum Dam and powerhouse on the Columbia River, involving 33,000 tons of reinforcing bars and other steel products. The award is expected shortly.

Highway construction continues to take heavy tonnages of reinforcing steel. There's also a substantial movement to other types of public and private building.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

40,000 tons, 55 story, 2.4 million sq ft office building, Grand Central Building Inc., New York, through Diesel Construction Co., general contractor, to American Bridge Div., U. S. Steel Corp., Pittsburgh. The structure will be erected on a 3½ acre site now occupied by the 6-story Grand Central Building, adjoining Grand Central Terminal. It will cost $100 million.

4750 tons, towers, Naval radio installation, Cutler, Maine, to Societa Anonima Electricacione, Milan, Italy, through Nat Harrison, Miami, Fla., subcontractor to Continental Electronics Mfg. Co., Boston; counterweights, rope, and miscellaneous steel to Bethlehem Steel Co., Bethlehem, Pa.

1120 tons, steel towers, Baker and Mt. Hebo air stations, Oregon, and Cottonwood, Idaho, to Isaacson Iron Works, Seattle, at $346,360 by U. S. Engineer; Bethlehem Pacific Coast Steel Corp., Seattle, bid $132,065 for Mt. Hebo only.

735 tons, laboratory and shop buildings, Ft. Bliss, Tex., to Darbyshire Steel Co. Inc., El Paso, Tex.; Robert E. McKee, El Paso, general contractor.

700 tons, ballistic missile installation, Fairchild Field, Washington State, to Isaacson Iron Works, Seattle; Patti-MacDonald Co. & Associates, general contractor.

530 tons, buildings, Ethan Allen AFB, Vermont, to Groisser & Shlager Iron Works, Somerville, Mass.; bids direct to U. S. Engineer, Waltham, Mass.

370 tons, also 650 tons of steel piling, radar tower, Naval AFB, Brunswick, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine. Bids direct to the U. S. Engineer, Waltham, Mass.

350 tons, bank building and garage, Liberty National Bank, Louisville, to Steel Fabricators Inc., Louisville; F. W. Owens Co., Louisville, general contractor; 90 tons of reinforcing bars to American Builders' Supply Co., Louisville.

STRUCTURAL STEEL PENDING

14,000 tons, transmission tower steel for Bonneville Power Administration, Portland, Oreg.; Societa Anonima Electrificacione, Milan, Italy, low at $3,324,556; Bethlehem Pacific Coast Steel Corp., Seattle, low domestic bidder at $4,074,406.

3750 tons, including 750 tons of bearing piles, balance steel sheet piling, foundations, Prudential Tower Center, Boston, to Bethlehem Steel Co., Bethlehem, Pa.; George A. Fuller Construction Co., Boston, general contractor.

571 tons, state bridgework, Somerset and Middlesex counties, New Jersey, bids June 4; also, 492 tons of reinforcing bars.

235 tons, three stringer bridges, Medford-Stoneham, Mass. C. J. Maney Co. Inc., Lexington, Mass., low on the general contract.

130 tons, two-span composite girder bridge, Willington, Conn., bids June 1, Hartford, Conn.

PRESSES & BRAKES

16' x 700 Ton BRAKE, $7500. 500-1500T Presses, 41-196" LR 200T Gap Frame, 99" LR, $3500. Sacrifice for immediate removal. Inspect in Cleveland under power.

Wender Presses, Inc.

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We are interested in purchasing
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WANTED METALLURGIST

Opportunity for graduate engineer experienced in furnace operations and quality control of ferroalloy production, especially chrome, silicon and manganese. Southern locations. Preferred age, in thirties. Salary open. All correspondence treated strictly confidential. Address reply to:

Walter E. Remmers
President
Pittsburgh Metallurgical Co., Inc.
Box 368 Niagara Falls, N. Y.

CLASSIFIED

ACCOUNTS WANTED

Aggressive manufacturers representative seeking new accounts, State of Ohio only. Excellent metallurgical background. Familiar with heat treating techniques and problems. Successful record of sales and public relations. BEST SALES, 6321 Crossview Road, Cleveland 31, Ohio.

Help Wanted

METAL FINISHING SPECIALIST. Young college graduate, chemist or engineer preferred. Wanted for development of processing oils and lubricants to be marketed to metal working industries. Position offers unusually attractive growth potential with nationally recognized Eastern United States oil refiner expanding into new field of activity. State full background, education, experience, and salary requirements. Write Box 767, STEEL, Penton Bldg., Cleveland 13, Ohio.

MIDWEST WIRE MILL desires a graduate M.E. Wire mill experience desirable but not essential. Should have 5-10 years practical experience in Mfg. When applying give complete resume of education, experience and salary requirements. Reply Box 768, STEEL, Penton Bldg., Cleveland 13, Ohio.

ACCOUNTANT WANTED

PROGRESSIVE STEEL CASTINGS FOUNDRY HAS OPENING FOR A STAFF ACCOUNTANT TO ASSIST CONTROLLER. APPLICANT MUST HAVE FOUNDRY EXPERIENCE IN STANDARD JOB AND PROCESS COST, BUDGETS, CREDITS AND COLLECTIONS, PREPARATION OF FINANCIAL STATEMENTS, INCENTIVE PLANS, AND SUPERVISION OF GENERAL ACCOUNTING FUNCTIONS. I.B.M. EXPERIENCE DESIRABLE. EXCELLENT OPPORTUNITY FOR FUTURE ADVANCEMENT WITH THIS MODERN FOUNDRY LOCATED IN THE MIDDLE-WEST. SEND COMPLETE DETAILS OF EDUCATION AND EXPERIENCE, AND SALARY REQUIREMENTS TO BOX 766, STEEL, PENTON BLDG., CLEVELAND 13, OHIO.

Representatives Wanted

WANTED: MANUFACTURERS' AGENT for New England territory to represent light hammer closed die forge plant. Please send particulars and lines now represented. Box 760, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

SALES MANAGER with 25 years experience in steel tubular products will relocate. Reply Box 765, STEEL, Penton Bldg., Cleveland 13, Ohio.

When you need 52100 steel bars and tubes go direct to Peterson....world's largest stocks. NOTE: For better machineability specify *leaded* bars.

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Consumers' Scrap Stocks Show Slight Increase

Stocks of ferrous scrap held by consumers on Mar. 31 were 8,237,000 gross tons, a slight increase over the previous month's total of 8,197,032 tons, reports the U. S. Bureau of Mines. Stocks of pig iron, 3,169,000 tons, were 4 per cent lower than they were at the end of February.

Home scrap produced during March totaled 3,860,000, an increase of 19 per cent over the February total. Purchased scrap received by consumers amounted to 2,849,000 tons, 26 per cent greater than during the preceding month. Of these purchases, 86 per cent was received from dealers and 14 per cent from other sources.

Domestic consumption of scrap for all purposes during March (6,661,000 tons) was the highest monthly quantity since October, 1956, reports the bureau. The purchased scrap received by consuming industries (2,849,000 tons) was the highest since January, 1957.

Pig iron consumed during the month (6,809,000 tons) was an all-time high,

The total metallics melt (scrap and pig iron) was 13,470,000 tons. It was the highest on record and consisted of 49.5 per cent scrap, and 50.5 per cent pig iron.

Pig Iron . . .

Pig Iron Prices, Page 188

May business in merchant pig iron is expected to be the best for any month so far this year. But trading is not particularly brisk, and there's only a little pressure from consumers seeking to build up inventories.

Deliveries are relatively easy, and users so far have shown little concern over the possibility of a stringency this summer in event of a steel strike. Continued offerings of foreign iron at prices under those of the domestic market, are contributing to complacency.

But sales are considerably better than they were a year ago at this season, with railroad shops and automobile foundries taking fairly sizable tonnages. Improved demand for castings is prompting foundries to order a little more tonnage than they had been.

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IS FAST,

ECONOMICAL,

TROUBLE-FREE

with Milford tubular rivets and automatic riveters

Mass production and automatic assembly cut costs only when all operations are trouble-free. That's why the high strength and uniform quality of Milford Tubular Rivets, plus Milford's wide line of precision riveters, are playing an active role in slashing today's production costs.

For the answers to assembly problems... *get in touch with Milford first!*

THE MILFORD RIVET & MACHINE CO.

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ELYRIA, OHIO • AURORA, ILL. • NORWALK, CALIF.

Tuffy Tips —on safe use of Slings and Hoist Lines

Safety Council Cites Factors In Lifting Injuries

The National Safety Council points out that nearly a fourth of all compensation cases are the result of unsafe handling methods or conditions, and lists the following as factors contributing to handling injuries:

"(a) Handling loads that are too heavy; (b) lifting or lowering with the back muscles instead of the leg muscles; (c) handling load with an insecure grip and failing to watch where hands are placed; (d) handling without sufficient help or failing to use mechanical equipment; (e) handling before getting a firm footing; (f) lifting or lowering with a jerking, twisting movement of the body, or when the body is in an awkward position."

Maintenance Tips for Hoisting Equipment

(1) Be sure crane and hoist controls are in proper working order. Don't use equipment that hasn't been tested recently.

(2) Inspect hitching equipment before it is used. Recheck after use.

(3) Remove hitching equipment not in use from hooks, hoists and loads. Don't allow it to remain loose.

(4) Store slings systematically when they're not in use. Don't let them lie around helter-skelter. They may be damaged between lifts.

Proper Sling Fittings Assure Greatest Safety and Efficiency

Fittings used on Tuffy Slings are of the most improved types and are factory-fitted on the Tuffy Sling you order. Or, if you prefer, you can fit them in your rigging loft. Shown here are two of these Tuffy Sling fittings.

Newco Gripper Sling Hook:

Fitted with a spring that bears against the sling. This holds slide hook at any position on sling, thus preventing it from sliding down to the sling eye each time it is unhitched. Easily positioned for each new load. Hook readily chokes into position when load is applied.

Sliding Hook

The smoothly rounded saddle slides on the sling leg with minimum wear to tighten on the load. Made of extraordinarily tough manganese steel to afford an ample factor of safety on rated loads. Designed with steel distributed in relation to stress lines.

Tuffy Hoist Line: Perfect Team Mate for Tuffy Slings

Tuffy Hoist Line is a special rope construction for use on all types of overhead cranes, derricks and clamshells. It has the right combination of strength, flexibility and toughness for greatest safety and longest life in its wide range of uses.

See Your Tuffy Distributor for the Most in Sling and Wire Rope Service

Ferrule Safety is a Part of Sling Safety

The steel ferrule is applied under tremendous pressure. It holds so tight that the eye splice has 100% of fabric strength. It's smoothly tapered to meet the main body of the sling. No abrupt edges or sharp projections. The extra quality and safety of Tuffy's pressed-on ferrule is yours at no extra cost.

Tuffy Braided Wire Fabric: Successor to Wire Rope in Slings

The secret of the extra strength and greater flexibility of Tuffy Slings is also the secret of their greater safety. It's the exclusive, patented, machine-braided fabric. You won't find it in any other sling. It means longer sling life, easier handling and greater ability to take deadloads, shocks and impact with safety.

Kinks Can't Hurt a Tuffy Sling

One of the first rules of ordinary wire rope safety: never use a sling that has been kinked. The wires are permanently bent, damaged and weakened. Not so with Tuffy Slings. Tuffy's patented, 9-part machine-braided fabric is just about impossible to kink. And if it does, under some unusual condition, you can straighten out the kink with ease—leaving no material damage.

FREE! New Tuffy Sling Handbook

Revised and enlarged edition. Covers slings from A to Z. Gives types, dimensions, weights, rated loads, proper fittings. Even includes safety-approved standard signals used in operation of various equipment. Send for your free copy now. Address **Union Wire Rope Corporation, 2160 Manchester Ave., Kansas City 26, Mo.** Specialists in high-carbon wire, wire rope, braided wire fabric and stress relieved wire and strand.

UNION Wire Rope

S-3

Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company
Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Southwest Steel Products

New steels are born at Armco

These incomparable annealing results prove

LEE WILSON'S OPENED COIL METHOD BEST!

Those familiar with annealing will recognize the chart below as an outstanding example of controlled uniformity in annealing.

This large 13-ton coil was subjected to 90 tests after it had been annealed in just 7¼ hours. From inside to outside Rockwell variance was held to an amazingly low three points.

This is not the exception, but rather the rule when steel is annealed by the new Opened Coil method developed and perfected by Lee Wilson engineers. Two pilot plants—one for tinplate and one for carbon steels—are now under construction—will soon be placed in operation in two of America's leading steel plants.

TABLE 1

SUMMARY PHYSICAL TESTS, METALLURGICAL TEST

SIZE: .0359" x 42¾" x 76¼"

PART: EXTERIOR DOOR PANEL

Weight 26,900 — Al-Killed Steel

		Outside as Annealed					Center		Inside as Annealed				
		1	2	3	4	5	6	7	8	9	10	Average	Range
ROCKWELL HARDNESS	E_1	43	44	43	44	44	43	43	43	44	44	43.5	43/44
	C	44	42	42	43	44	43	43	44	44	43	43.2	42/44
	E_2	43	42	44	44	44	42	42	44	45	44	43.4	42/45
OLSEN DUCTILITY	E_1	415	415	420	420	420	420	420	415	415	415	417.5	415/420
	C	410	415	415	425	420	420	415	420	415	415	417.0	410/425
	E_2	410	415	420	425	415	415	415	415	415	420	416.5	410/425
MICRO GRAIN SIZE	E_1	6	6/7	6/7	6/7	7	7	7/8	7/8	7	7/8	.....	.....
	C	6/7	6/7	6/7	6/7	7/8	7/8	7/8	7/8	7/8	7/8	.....	.....
	E_2	6/7	6/7	6	6/7	7/8	7/8	7	7	7	7		

		L	T	L	T	L	T
TENSILE RESULTS	Yld. Str. (psi)	27,540	27,780	26,460	27,010	26,750	27,780
	Tens. Str. (psi)	44,910	45,290	45,760	45,210	46,680	47,050
	% Elong. (2")	40.0	39.0	40.0	38.0	39.0	39.0

Opened coil being rewound into a tight coil after annealing by Lee Wilson's patented coil handling system.

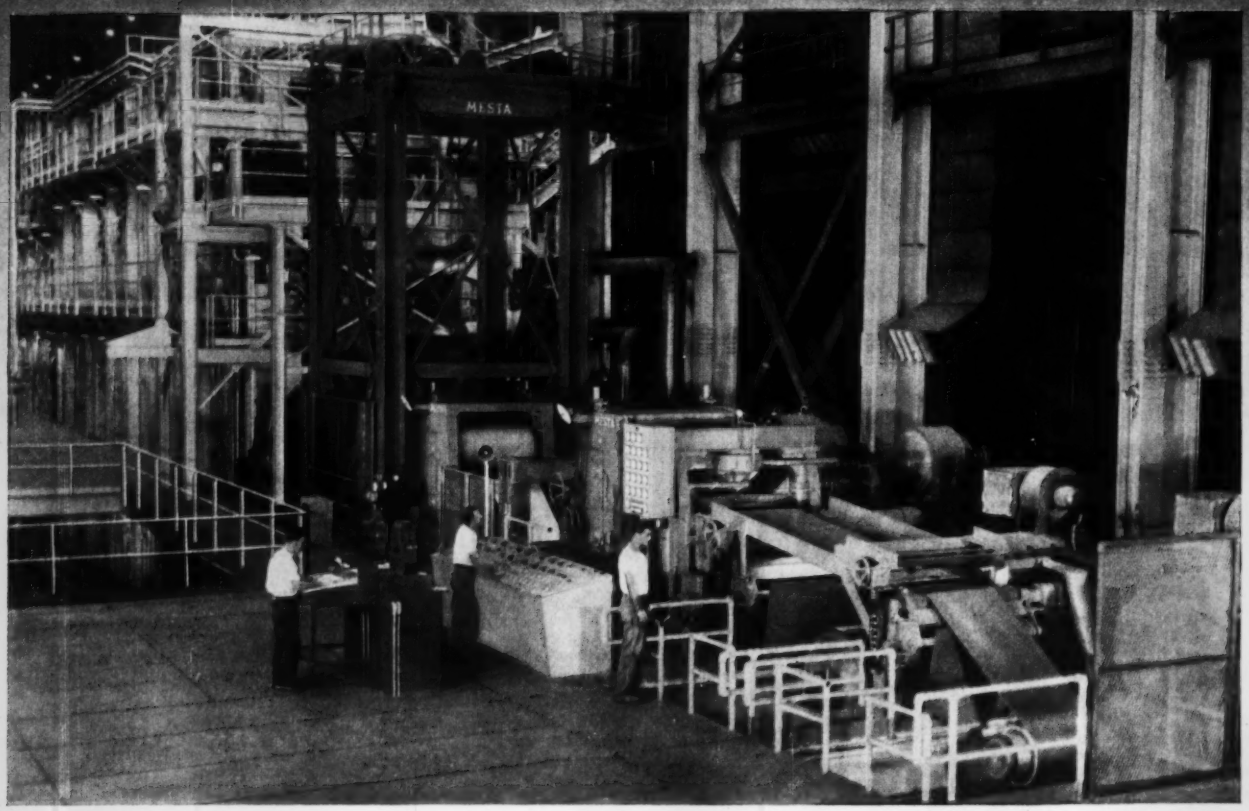
Lee Wilson ENGINEERING COMPANY, INC.

HIGH PRODUCTION ANNEALING SYSTEMS

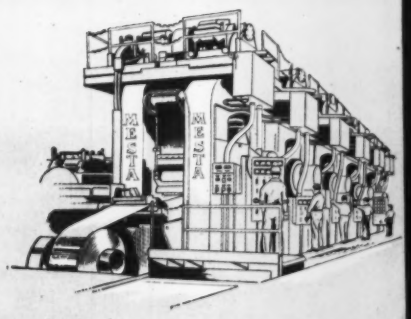
MAKE THE BEST METALS BETTER

ORIGINATORS AND LEADING PRODUCERS OF OPENED COIL AND SINGLE STACK FURNACES

CLEANING AND ANNEALING LINES



MESTA 2000 FPM Continuous Cleaning and Annealing Line for Steel Strip in Tin Plate Gauges with Pay-Off Reels, Mash Welder and Tension Reels in Operation at Weirton Steel Company, Division of National Steel Corporation.



Designers and Builders of Complete Steel Plants

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